

Access DB# 53052

SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: LAN VINH Examiner #: 76531 Date: 10/11/1001
Art Unit: 1765 Phone Number 305-6302 Serial Number: 09/206027
Mail Box and Bldg/Room Location: 10021 Results Format Preferred (circle) PAPER DISK E-MAIL
(P3)

If more than one search is submitted, please prioritize searches in order of need.

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: PLASMA PRECLEAN WITH ARGON, HELIUM, AND HYDROGEN
Inventors (please provide full names): BARNEY M COHEN, KENNY KING TAI NGAN,
XIANGBING LI (P3)

Earliest Priority Filing Date: 12/4/1998

For Sequence Searches Only Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

EXPOSING A SUBSTRATE (SEMICONDUCTOR WAFER) TO A PLASMA
CONTAINS ONLY ARGON (AR), HELIUM (He) and HYDROGEN (H₂)

STAFF USE ONLY

	Type of Search	Vendors and cost where applicable
Searcher: <u>EN</u>	NA Sequence (#) _____	STN <u>\$94.76</u>
Searcher Phone #: _____	AA Sequence (#) _____	Dialog _____
Searcher Location: _____	Structure (#) <u>(1)</u>	Questel/Orbit _____
Date Searcher Picked Up: _____	Bibliographic <u>(and)</u>	Dr. Link _____
Date Completed: <u>10-17-01</u>	Litigation _____	Lexis/Nexis _____
Searcher Prep & Review Time: <u>10</u>	Fulltext _____	Sequence Systems _____
Clerical Prep Time: _____	Patent Family _____	WWW/Internet _____
Online Time: <u>60</u>	Other _____	Other (specify) _____

PTO-1590 (1-2000)

=> file reg

FILE 'REGISTRY' ENTERED AT 15:38:53 ON 17 OCT 2001
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FILE 'REGISTRY' ENTERED AT 14:58:05 ON 17 OCT 2001

E ARGON/CN
L1 1 SEA ARGON/CN
E HELIUM/CN
L2 1 SEA HELIUM/CN
E HYDROGEN/CN
L3 1 SEA HYDROGEN/CN

FILE 'HCA' ENTERED AT 15:01:11 ON 17 OCT 2001

L4 217269 SEA L1 OR ARGON# OR AR
L5 206814 SEA L2 OR HELIUM# OR HE
L6 438726 SEA L3 OR H2 OR (H OR HYDROGEN#) (2A) (GAS## OR GASIF? OR
GASEOUS? OR ATM# OR ATMOS? OR INJECT? OR INTRODUC? OR
NOZZL? OR JET OR JETS OR APPLY? OR APPLIED OR APPLICATION
? OR TREAT? OR PRETREAT? OR PROCESS? OR PREPROCESS?)

FILE 'LCA' ENTERED AT 15:07:28 ON 17 OCT 2001

L7 1939 SEA PLASMA#
L8 441 SEA (ETCH? OR CHASE# OR CHASING# OR ENCHAS? OR ENGRAV?
OR EMBOSS? OR INCIS? OR IMPRINT? OR IMPRESS? OR ENCAUSTIC
?)/BI,AB
L9 432 SEA (ETCH? OR MICROETCH? OR CHASE# OR CHASING# OR
ENCHAS? OR ENGRAV? OR MICROENGRAV? OR EMBOSS? OR INCISE#
OR INCISING# OR IMPRINT? OR IMPRESS? OR ENCAUSTIC?)/BI,A
B
L10 973 SEA PRECLEAN? OR CLEAN? OR STERILIZ? OR STERILIS? OR
DECONTAMINA? OR SANIT? OR HYGIEN? OR DISINFECT? OR
SCRUB? OR SCOUR? OR DEGREAS?

FILE 'HCA' ENTERED AT 15:14:33 ON 17 OCT 2001

L11 6598 SEA L4 AND L5 AND L6
L12 1010 SEA L11 AND L7
L13 122 SEA L12 AND L9
L14 67 SEA L12 AND L10
L15 21 SEA L13 AND L14

FILE 'LCA' ENTERED AT 15:17:15 ON 17 OCT 2001

L16 526 SEA (THREE? OR 3 OR TRIPL? OR TREBL? OR TRIAD?) (3A) (COMPO
NENT? OR CONSTITUENT? OR GAS## OR GASEOUS? OR GASIF? OR
PART OR PARTS OR PORTION?)

FILE 'HCA' ENTERED AT 15:22:12 ON 17 OCT 2001

L17 24 SEA L12 AND L16
L18 4 SEA L17 AND L9
L19 0 SEA L17 AND L10

FILE 'REGISTRY' ENTERED AT 15:23:36 ON 17 OCT 2001
E SILICA/CN

L20 1 SEA SILICA/CN
L21 418 SEA (SI(L)N)/ELS (L) 2/ELC.SUB

FILE 'HCA' ENTERED AT 15:25:43 ON 17 OCT 2001

L22 583949 SEA L20 OR L21 OR (SILICON OR SI) (W) (OXIDE# OR DIOXIDE#)
OR SILICA# OR SIO2 OR (SILICON OR SI) (W) NITRIDE# OR SIN
L23 115 SEA L12 AND L22
L24 4 SEA L17 AND L22
L25 46 SEA L13 AND L22
L26 17 SEA L14 AND L22
L27 10 SEA L25 AND L26

FILE 'LCA' ENTERED AT 15:27:54 ON 17 OCT 2001

L28 10450 SEA (SUBSTRAT? OR SURFACE? OR BASE# OR SUBSTRUCT? OR
UNDERSTRUCT? OR UNDERLAY? OR FOUNDATION? OR PANE? OR
DISK? OR DISC# OR WAFER?)/BI,AB

FILE 'HCA' ENTERED AT 15:28:29 ON 17 OCT 2001

L29 51870 SEA L22 (3A) L28
L30 14 SEA L12 AND L29
L31 1 SEA L17 AND L29
L32 6 SEA L18 OR L24 OR L31
L33 10 SEA L27 NOT L32
L34 11 SEA L30 NOT (L32 OR L33)
L35 11 SEA L15 NOT (L32 OR L33 OR L34)
L36 18 SEA L17 NOT (L32 OR L33 OR L34 OR L35)

=> file hca

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=> d l32 1-6 ibib abs hitstr hitind

L32 ANSWER 1 OF 6 HCA COPYRIGHT 2001 ACS
ACCESSION NUMBER: 133:343429 HCA
TITLE: Plasma etching of silicon
INVENTOR(S): Laermer, Franz; Schilp, Andrea; Elsner, Bernhard
PATENT ASSIGNEE(S): Robert Bosch G.m.b.H., Germany
SOURCE: Ger. Offen., 6 pp.
CODEN: GWXXBX

DOCUMENT TYPE: Patent
 LANGUAGE: German
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 19919469	A1	20001102	DE 1999-19919469	19990429
WO 2000067307	A1	20001109	WO 2000-DE821	20000316
W: JP, KR, US				
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
EP 1095400	A1	20010502	EP 2000-929216	20000316
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				

PRIORITY APPLN. INFO.: DE 1999-19919469 A 19990429
 WO 2000-DE821 W 20000316

AB **Plasma etching**, esp. anisotropic **plasma etching**, of lateral structures in a Si substrate is carried out by using a process gas. Before and/or during **etching**, side walls of the structures are at least temporarily covered with a passivating material. Typically, (1) a F-supplying **etching** gas contg. ClF₃, BrF₃, and/or IF₅, (2) a passivating material-consuming additive, esp. NF₃, and/or (3) an easily ionizable **gas**, esp. H₂, Ne, or Ar is added to the process gas.

IT 1333-74-0, **Hydrogen**, uses 7440-37-1, **Argon**, uses 7440-59-7, **Helium**, uses 7631-86-9, **Silica**, uses (in **process** gas for **plasma etching** of silicon)

RN 1333-74-0 HCA
 CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H-H

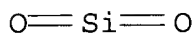
RN 7440-37-1 HCA
 CN Argon (8CI, 9CI) (CA INDEX NAME)

Ar

RN 7440-59-7 HCA
 CN Helium (7CI, 8CI, 9CI) (CA INDEX NAME)

He

RN 7631-86-9 HCA
CN Silica (7CI, 8CI, 9CI) (CA INDEX NAME)



IC ICM C23F004-00
CC 76-3 (Electric Phenomena)
ST **plasma etching** silicon
IT **Etching**
(**plasma**; of silicon)
IT 75-46-7, Trifluoromethane 75-73-0, Tetrafluoromethane 76-16-4,
Hexafluoroethane 76-19-7, Octafluoropropane 115-25-3,
Perfluorocyclobutane 116-15-4, Hexafluoropropene 124-38-9,
Carbon dioxide, uses 355-25-9, Decafluorobutane **1333-74-0**
, **Hydrogen**, uses 2551-62-4, Sulfur hexafluoride
7440-01-9, Neon, uses **7440-37-1**, **Argon**, uses
7440-59-7, **Helium**, uses 7631-86-9,
Silica, uses 7727-37-9, Nitrogen, uses 7782-44-7,
Oxygen, uses 7783-54-2, Nitrogen trifluoride 7783-61-1
7783-66-6, Iodine fluoride (IF5) 7787-71-5, Bromine fluoride
(BrF3) 7790-91-2, Chlorine fluoride (ClF3) 10024-97-2, Nitrogen
oxide (N2O), uses 10102-43-9, Nitrogen oxide (NO), uses
10102-44-0, Nitrogen oxide (NO2), uses 11104-93-1, Nitrogen oxide,
uses
(in **process** gas for **plasma etching**
of silicon)
IT 7440-21-3, Silicon, processes
(**plasma etching** of)

REFERENCE COUNT: 6
REFERENCE(S): (1) Anon; EP 0414373 A2 HCA
(2) Anon; DE 19641288 A1 HCA
(3) Anon; DE 19706682 C2 HCA
(5) Anon; DE 4202447 A1 HCA
(6) Anon; DE 4241045 C1 HCA
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 2 OF 6 HCA COPYRIGHT 2001 ACS
ACCESSION NUMBER: 133:245945 HCA
TITLE: Selective dry **etching** of InGaP over
GaAs in inductively coupled **plasmas**
AUTHOR(S): Leerungnawarat, P.; Cho, H.; Hays, D. C.; Lee,
J. W.; Devre, M. W.; Reelfs, B. H.; Johnson, D.;
Sasserath, J. N.; Abernathy, C. R.; Pearton, S.
J.
CORPORATE SOURCE: Department of Materials Science and Engineering,
University of Florida, Gainesville, FL, 32611,
USA
SOURCE: J. Electron. Mater. (2000), 29(5), 586-590
CODEN: JECMA5; ISSN: 0361-5235
PUBLISHER: Minerals, Metals & Materials Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB By exploiting the relatively high volatility of In **etch** products in CH₄/H₂ discharges, we were able to obtain a max. selectivity for InGaP over GaAs of .apprx.20 at low ion energies and fluxes. **Three** different inert **gas** additives to CH₄/H₂ were examd., with **Ar** producing higher selectivities than **He** or Xe. This process is attractive for selective removal of the InGaP emitter in the fabrication of heterojunction bipolar transistors.

IT 1333-74-0, Hydrogen, uses 7440-37-1, **Argon**, uses 7440-59-7, **Helium**, uses (selective dry **etching** of InGaP over GaAs in inductively coupled **plasmas**)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H-H

RN 7440-37-1 HCA

CN Argon (8CI, 9CI) (CA INDEX NAME)

Ar

RN 7440-59-7 HCA

CN Helium (7CI, 8CI, 9CI) (CA INDEX NAME)

He

CC 76-11 (Electric Phenomena)

ST dry **etching** gallium indium phosphide arsenide inductively coupled **plasmas**

IT **Etching**
(dry; selective dry **etching** of InGaP over GaAs in inductively coupled **plasmas**)

IT **Etching** kinetics
Heterojunction bipolar transistors
Inductively coupled **plasma**
(selective dry **etching** of InGaP over GaAs in inductively coupled **plasmas**)

IT 1303-00-0, Gallium arsenide (GaAs), processes 12776-63-5, Gallium indium phosphide (GaInP₂)
(selective dry **etching** of InGaP over GaAs in inductively coupled **plasmas**)

IT 74-82-8, Methane, uses 1333-74-0, Hydrogen, uses 7440-37-1, **Argon**, uses 7440-59-7,

Helium, uses 7440-63-3, **Xenon**, uses
(selective dry **etching** of InGaP over GaAs in
inductively coupled **plasmas**)

REFERENCE COUNT: 21

REFERENCE(S): (1) Abernathy, C; Appl Phys Lett 1992, V61,
P1092 HCA
(3) Bour, D; Quantum Well Lasers 1993, P415 HCA
(6) Groves, S; Appl Phys Lett 1992, V61, P255
HCA
(8) Hanson, A; IEEE Electron Dev Lett EDL 1993,
V14, P25 HCA
(9) Hays, D; Electron Solid-State Lett 1999, V2,
P587 HCA

ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 3 OF 6 HCA COPYRIGHT 2001 ACS

ACCESSION NUMBER: 131:338340 HCA

TITLE: **Plasma** chemical vapor coated
transparent and gas-barrier film and laminate
for packaging made from the same

INVENTOR(S): Ohoshi, Takanori; Mikami, Koichi

PATENT ASSIGNEE(S): Dainippon Printing Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 12 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	JP 11322984	A2	19991126	JP 1998-153999	19980519
AB	The film comprises a substrate, an inorg. oxide coating layer made from a plasma chem.-vapor coating process on one side of the substrate and a gas plasma layer from O, Ar and/or He on the surface of the chem.-vapor deposition layer. Thus, plasma chem. deposition coating a biaxially stretched PET film at 10 KW, speed of 100 m/min and at a gas flow of 1:3:3 slm (std. litter minute) of methamethyldisiloxane, O and He mixt. in a vacuum chamber at 5.0 .times. 10 ⁻⁵ m-bar and bonding with a polypropylene film by a polyurethane adhesive gave a laminate showing O permeability 0.8 mL/m ² -day at 23.degree. and 90% RH and steam permeability 0.8 g/m ² -day at 40.degree. and 100% RH.				
IT	1333-74-0, Hydrogen , processes 7440-37-1, Argon , processes 7440-59-7, Helium , processes (plasma chem. vapor coated transparent and gas-barrier film and laminate for packaging made from the same)				
RN	1333-74-0 HCA				
CN	Hydrogen (8CI, 9CI) (CA INDEX NAME)				

H-H

RN 7440-37-1 HCA
CN Argon (8CI, 9CI) (CA INDEX NAME)

Ar

RN 7440-59-7 HCA
CN Helium (7CI, 8CI, 9CI) (CA INDEX NAME)

He

IT 7631-86-9, Silicon dioxide, uses
(**plasma** coating of; **plasma** chem. vapor coated
transparent and gas-barrier film and laminate for packaging made
from the same)
RN 7631-86-9 HCA
CN Silica (7CI, 8CI, 9CI) (CA INDEX NAME)

O=Si=O

IC ICM C08J007-06
ICS B32B009-00; B32B027-06; B32B027-36; B65D065-40; C08J007-04;
C23C016-50
CC 42-2 (Coatings, Inks, and Related Products)
Section cross-reference(s): 38
ST polyester oxygen **helium** hexamethyldisiloxane
plasma treatment; gas steam barrier packaging film;
polypropylene laminate PET gas barrier
IT Polyamides, miscellaneous
(films; **plasma** chem. vapor coated transparent and
gas-barrier film and laminate for packaging made from the same)
IT Packaging materials
(gas-impermeable; **plasma** chem. vapor coated transparent
and gas-barrier film and laminate for packaging made from the
same)
IT Laminated plastics, uses
(**plasma** chem. vapor coated transparent and gas-barrier
film and laminate for packaging made from the same)
IT Polyesters, uses
(**plasma** treatment of, laminates; **plasma** chem.
vapor coated transparent and gas-barrier film and laminate for
packaging made from the same)
IT Polymerization

Vapor deposition process

- (**plasma**; **plasma** chem. vapor coated transparent and gas-barrier film and laminate for packaging made from the same)
- IT Coating materials
(water-resistant; **plasma** chem. vapor coated transparent and gas-barrier film and laminate for packaging made from the same)
- IT 9003-07-0, Polypropylene
(**plasma** chem. vapor coated transparent and gas-barrier film and laminate for packaging made from the same)
- IT 1333-74-0, **Hydrogen, processes**
7440-21-3, Silicon, processes 7440-37-1, Argon, processes 7440-44-0, Carbon, processes 7440-59-7, Helium, processes 7782-44-7, Oxygen, processes
(**plasma** chem. vapor coated transparent and gas-barrier film and laminate for packaging made from the same)
- IT 7631-86-9, **Silicon dioxide**, uses
26298-61-3, Hexamethyldisiloxane homopolymer
(**plasma** coating of; **plasma** chem. vapor coated transparent and gas-barrier film and laminate for packaging made from the same)
- IT 25038-59-9, PET polymer, uses
(**plasma** treatment of, laminates; **plasma** chem. vapor coated transparent and gas-barrier film and laminate for packaging made from the same)

L32 ANSWER 4 OF 6 HCA COPYRIGHT 2001 ACS
 ACCESSION NUMBER: 131:178553 HCA
 TITLE: Surface **treatment** by **hydrogen**
 reduction using water vapor
 INVENTOR(S): Takamatsu, Toshiyuki
 PATENT ASSIGNEE(S): Mitchell, James W., USA
 SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 2
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 11233494	A2	19990827	JP 1998-177972	19980521
PRIORITY APPLN. INFO.:			JP 1997-366109	19971203

AB Surface treatment of a substrate includes the following steps; (1) setting a substrate in a treatment chamber which is placed lower than a **plasma** generation chamber, (2) introducing a mixt. gas of (a) .gtoreq.1 gas (A) selected from N2 and Group VIIIA elements (**He**, Ne, **Ar**, Kr, Xe, and Rn) and (b) H-free and water vapor-contg. gas, where concn. of the water vapor is lower than that of A, into the **plasma** generation chamber, (3) introducing a **gas** into a gas flow

which is halfway from the **plasma** generation chamber and the treatment chamber. The gas introduced in the gas flow may contain a halogen, F, Si, or C. The treatment method, such as **plasma etching** or CVD, is performed safely and at low cost.

IT 7631-86-9, Silica, processes
 (deposited layer; **surface treatment** by
 H redn. using H-free **gas** contg. water
 vapor)
 RN 7631-86-9 HCA
 CN Silica (7CI, 8CI, 9CI) (CA INDEX NAME)

O=Si=O

IT 7440-37-1, Argon, uses 7440-59-7,
 Helium, uses
 (surface **treatment** by H redn. using H
 -free **gas** contg. water vapor and)
 RN 7440-37-1 HCA
 CN Argon (8CI, 9CI) (CA INDEX NAME)

Ar

RN 7440-59-7 HCA
 CN Helium (7CI, 8CI, 9CI) (CA INDEX NAME)

He

IC ICM H01L021-3065
 ICS C23C016-50; C23F004-00; H01L021-205; H01L021-31
 CC 76-11 (Electric Phenomena)
 Section cross-reference(s): 75
 ST surface **treatment hydrogen** redn water vapor;
plasma etching water vapor nitrogen gas; CVD
plasma ethanol nitrogen carbon film
 IT **Etching**
 Vapor deposition process
 (**plasma**; **surface treatment** by H
 redn. using H-free **gas** contg. water vapor)
 IT Reduction
 Water vapor
 (surface **treatment** by H redn. using H
 -free **gas** contg. water vapor)
 IT 7440-44-0, Carbon, processes 7631-86-9, Silica,
 processes
 (deposited layer; **surface treatment** by

H redn. using H-free gas contg. water vapor)

IT 7440-21-3, Silicon, processes
(substrate; surface treatment by H redn.
using H-free gas contg. water vapor)

IT 7732-18-5, Water, uses
(surface treatment by H redn. using H
-free gas contg. water vapor)

IT 64-17-5, Ethanol, uses 7439-90-9, Krypton, uses 7440-01-9, Neon,
uses 7440-37-1, Argon, uses 7440-59-7,
Helium, uses 7440-63-3, Xenon, uses 7727-37-9, Nitrogen,
uses 7783-54-2, Nitrogen trifluoride 7803-62-5, Silane, uses
10043-92-2, Radon, uses
(surface treatment by H redn. using H
-free gas contg. water vapor and)

L32 ANSWER 5 OF 6 HCA COPYRIGHT 2001 ACS
ACCESSION NUMBER: 131:145417 HCA
TITLE: Surface-modified polyimide films with improved
adhesion
INVENTOR(S): Matsubara, Takeyuki; Uchiyama, Hiroshi
PATENT ASSIGNEE(S): Ube Industries, Ltd., Japan; E. C. Chemical
Industry Co., Ltd.
SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 11209488	A2	19990803	JP 1998-32088	19980128

AB Polyimide films of 20-125 .mu.m thickness and comprising fine
particles of an inorg. filler and a polyimide resin which is prepd.
from arom. tetracarboxylic acid component contg. 3
,3',4,4'-biphenyltetracarboxylic acid, its anhydride, or
esters and arom. diamine component including p-phenylenediamine are
subjected to plasma arc treatment to increase the metal
(from the filler) content on one side of the surfaces to 0.03-0.5
atom% and to increase surface oxygen/carbon ratio 0.01-0.20.

IT 7631-86-9, Silica, uses
(filler in films; surface-modified polyimide films with improved
adhesion)

RN 7631-86-9 HCA
CN Silica (7CI, 8CI, 9CI) (CA INDEX NAME)

O=Si=O

IT 1333-74-0, Hydrogen, uses 7440-37-1, Argon

, uses 7440-59-7, Helium, uses
(plasma; surface-modified polyimide films with improved
adhesion)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H-H

RN 7440-37-1 HCA

CN Argon (8CI, 9CI) (CA INDEX NAME)

Ar

RN 7440-59-7 HCA

CN Helium (7CI, 8CI, 9CI) (CA INDEX NAME)

He

IC ICM C08J007-00

ICS C08J005-18; C08K003-00; C08L079-08

CC 38-3 (Plastics Fabrication and Uses)

ST polyimide film phenylenediamine biphenyltetracarboxylic dianhydride
plasma treatment; adhesion improvement polyimide film
plasma treatment

IT Plasma

(surface-modified polyimide films with improved adhesion)

IT 7631-86-9, Silica, uses

(filler in films; surface-modified polyimide films with improved
adhesion)

IT 1333-74-0, Hydrogen, uses 7440-37-1, Argon

, uses 7440-59-7, Helium, uses 7727-37-9,

Nitrogen, uses

(plasma; surface-modified polyimide films with improved
adhesion)

L32 ANSWER 6 OF 6 HCA COPYRIGHT 2001 ACS

ACCESSION NUMBER: 118:245701 HCA

TITLE: Effects of inert gas dilution of 1,
3-butadiene on plasma

deposition of hydrogenated amorphous carbon

AUTHOR(S): Seth, Jayshree; Babu, S. V.

CORPORATE SOURCE: Cent. Adv. Mater. Process., Clarkson Univ.,
Potsdam, NY, 13699, USA

SOURCE: J. Appl. Phys. (1993), 73(5), 2496-504

CODEN: JAPIAU; ISSN: 0021-8979

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Hydrogenated amorphous carbon films (a-C:H) were deposited by the **plasma** decompn. of mixts. of 1,3-butadiene with different inert gas diluents (**Ar**, Ne, and **He**). Several characteristics of the **plasma** and the deposited films were investigated for deposition gas mixts. ranging in concn. from 0 to 90% of the diluent. Measurement of the optical emission from the **plasma** indicated the presence of the same dominant species from the hydrocarbon source (CH 430 nm system, and hydrogen Balmer lines) for all the mixts. contg. the diluents, although the relative intensities were markedly different. The H^*/H_2^* and H^*/CH^* emission intensity ratios increased with the concn. of butadiene in **argon**- and neon-dild. mixts. while remaining relatively const. in butadiene/**helium plasmas**. Details of some the bonding configurations were detd. from an anal. of the various IR-absorption bands. Film characterization included **etch** rate measurements in an oxygen **plasma** as well as the detn. of the d. and the optical band gap for different deposition gas mixts. All the measurements suggest that when the diluent concn. exceeds .apprx.75% the film structure undergoes a well-defined transition to a predominantly sp² structure. The relation between the film properties and the deposition gas mixt. and the reactive species present in the **plasma** is discussed.

IT 1333-74-0, Hydrogen, properties
(**plasma** deposition of amorphous carbon contg., from butadiene dild. with inert gases)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H-H

IT 7440-37-1, Argon, properties 7440-59-7, Helium, properties
(**plasma** deposition of hydrogenated amorphous carbon from gas mixts. of butadiene and)

RN 7440-37-1 HCA

CN Argon (8CI, 9CI) (CA INDEX NAME)

Ar

RN 7440-59-7 HCA

CN Helium (7CI, 8CI, 9CI) (CA INDEX NAME)

He

CC 76-11 (Electric Phenomena)
 ST **plasma** deposition hydrogenated amorphous carbon;
argon butadiene amorphous carbon **plasma**
 deposition; neon butadiene amorphous carbon **plasma**
 deposition; **helium** butadiene amorphous carbon
plasma deposition; butadiene amorphous carbon **plasma**
 deposition
 IT **Helium**-group gases, properties
 (plasma deposition of hydrogenated amorphous carbon
 from gas mixts. of butadiene and)
 IT Vapor deposition processes
 (plasma, of hydrogenated amorphous carbon, from gas
 mixts. of butadiene and inert gases)
 IT 1333-74-0, Hydrogen, properties
 (plasma deposition of amorphous carbon contg., from
 butadiene dild. with inert gases)
 IT 7440-01-9, Neon, properties 7440-37-1, Argon,
 properties 7440-59-7, Helium, properties
 (plasma deposition of hydrogenated amorphous carbon
 from gas mixts. of butadiene and)
 IT 106-99-0, 1,3-Butadiene, properties
 (plasma deposition of hydrogenated amorphous carbon
 from gas mixts. of inert gas and)
 IT 7440-44-0, Carbon, properties
 (plasma deposition of hydrogenated amorphous, from
 butadiene dild. with inert gases)

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L33 ANSWER 1 OF 10 HCA COPYRIGHT 2001 ACS
 134:347190 **Plasma cleaning** step in a salicide
 process. Saigal, Dinesh; King, Rochelle; Singhal, Ajay (Applied
 Materials, Inc., USA). Eur. Pat. Appl. EP 1099776 A1 20010516, 13
 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT,
 LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (English). CODEN:
 EPXXDW. APPLICATION: EP 2000-309958 20001109. PRIORITY: US
 1999-437573 19991109.
 AB Before forming a transition metal silicide in the gate and
 drain/source regions of a MOS device, the exposed Si regions to be
 coated and reacted are **plasma cleaned** first.
 The **plasma gas** consists of H or H/
 He or He mixts. with NF₃, CF₄, SF₆, etc.
 IT 7440-37-1, Argon, processes 7440-59-7,
 Helium, processes
 (in **plasma cleaning** step in salicide process
 for MOS device fabrication)
 RN 7440-37-1 HCA
 CN Argon (8CI, 9CI) (CA INDEX NAME)

Ar

RN 7440-59-7 HCA
CN Helium (7CI, 8CI, 9CI) (CA INDEX NAME)

He

IT 1333-74-0, **Hydrogen, processes**
(in **plasma cleaning** step in salicide process
for MOS device fabrication)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H-H

IT 7631-86-9, **Silica, processes**
(**plasma cleaning** step in salicide process for
MOS device fabrication)
RN 7631-86-9 HCA
CN Silica (7CI, 8CI, 9CI) (CA INDEX NAME)

O=Si=O

IC ICM C23C014-02
ICS H01L021-306; H01L021-336; H01L021-285; H01L021-3205
CC 76-3 (Electric Phenomena)
ST **plasma cleaning** salicidation; MOS device
fabrication salicidation **plasma cleaning**
IT Hydrocarbons, processes
(fluoro; in **plasma cleaning** step in salicide
process for MOS device fabrication)
IT Sputtering
(metal; in **plasma cleaning** step in salicide
process for MOS device fabrication)
IT **Cleaning**
Dielectric films
MOS devices
Siliconizing
(**plasma cleaning** step in salicide process for
MOS device fabrication)
IT Metals, processes
(**plasma cleaning** step in salicide process for
MOS device fabrication)
IT Noble metals
Refractory metals

- (**plasma cleaning** step in salicide process for MOS device fabrication)
- IT Transition metal silicides
(**plasma cleaning** step in salicide process for MOS device fabrication)
- IT Ion implantation
(**plasma cleaning** step in salicide process for MOS device fabrication using)
- IT **Cleaning**
(**plasma**, **plasma cleaning** step in salicide process for MOS device fabrication)
- IT **Etching**
(selective, **silica**, **plasma cleaning** step in salicide process for MOS device fabrication)
- IT 7440-37-1, **Argon**, processes 7440-59-7, **Helium**, processes
(in **plasma cleaning** step in salicide process for MOS device fabrication)
- IT 75-73-0, Carbon fluoride (CF₄) 1333-74-0, **Hydrogen**, processes 2551-62-4, Sulfur fluoride (SF₆) 7783-54-2, Nitrogen fluoride (NF₃)
(in **plasma cleaning** step in salicide process for MOS device fabrication)
- IT 7439-98-7, Molybdenum, processes 7440-02-0, Nickel, processes 7440-05-3, Palladium, processes 7440-06-4, Platinum, processes 7440-25-7, Tantalum, processes 7440-32-6, Titanium, processes 7440-33-7, Tungsten, processes 7440-48-4, Cobalt, processes 11101-13-6
(**plasma cleaning** step in salicide process for MOS device fabrication)
- IT 7440-21-3, Silicon, processes
(**plasma cleaning** step in salicide process for MOS device fabrication)
- IT 7631-86-9, **Silica**, processes
(**plasma cleaning** step in salicide process for MOS device fabrication)

L33 ANSWER 2 OF 10 HCA COPYRIGHT 2001 ACS

- 134:187168 Methods of pre-**cleaning** dielectric layers of substrates in semiconductor device fabrication. Cohen, Barney M.; Rengarajan, Suraj; Li, Xiangbing; Ngan, Kenny King-tai; Ding, Peijun (Applied Materials, Inc., USA). Eur. Pat. Appl. EP 1081751 A2 20010307, 21 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (English). CODEN: EPXXDW. APPLICATION: EP 2000-307537 20000901. PRIORITY: US 1999-388989 19990902; US 1999-388991 19990902.
- AB The disclosure relates to a method for improving fill and elec. performance of metals deposited on patterned dielec. layers. Apertures such as bias and trenches in the patterned dielec. layer are **etched** to enhance filling and then **cleaned** in the same chamber to reduce metal oxides within the aperture. The patterned dielec. is **cleaned** in a processing chamber (20)

with a 1st **plasma** consisting essentially of **Ar** (212) wherein the 1st **plasma** is generated by supplying power to a coil surrounding the processing chamber and supplying bias to a substrate support member supporting the substrate, the patterned dielec. layer is **cleaned** in the processing chamber with a 2nd **plasma** consisting essentially of H and **He** (215) wherein the 2nd **plasma** is generated by increasing the supply of power to the coil surrounding the processing chamber and reducing the supply of bias to the substrate support member supporting the substrate, a barrier layer is deposited on the patterned dielec. layer after exposing the dielec. layer to the 1st **plasma** and the 2nd **plasma** (220) and a metal is deposited on the barrier layer (225). Also, the sequential **plasma** treatments can be practiced in a variety of **plasma** processing chambers of an integrated process sequence, including pre-**clean** chambers, phys. vapor deposition chambers, **etch** chambers, and other **plasma** processing chambers. The pre-**clean** process can also repair damage to the dielec. caused by preceding process steps, such a O **plasma** ashing processes for removing photoresist.

IT 7631-86-9, **Silica**, processes
 (carbon doped; pre-**cleaning** dielec. layers of
 substrates in semiconductor device fabrication with)
 RN 7631-86-9 HCA
 CN Silica (7CI, 8CI, 9CI) (CA INDEX NAME)

O=Si=O

IT 1333-74-0, **Hydrogen**, processes
 7440-37-1, **Argon**, processes 7440-59-7,
 Helium, processes
 (in pre-**cleaning** dielec. layers of substrates in
 semiconductor device fabrication)
 RN 1333-74-0 HCA
 CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H-H

RN 7440-37-1 HCA
 CN Argon (8CI, 9CI) (CA INDEX NAME)

Ar

RN 7440-59-7 HCA
 CN Helium (7CI, 8CI, 9CI) (CA INDEX NAME)

He

IC ICM H01L021-285
 CC 76-3 (Electric Phenomena)
 ST **argon** hydrogen **helium** **plasma**
cleaning dielec film
 IT Annealing
Plasma
 (in pre-**cleaning** dielec. layers of substrates in
 semiconductor device fabrication)
 IT Oxides (inorganic), processes
 (in pre-**cleaning** dielec. layers of substrates in
 semiconductor device fabrication)
 IT **Cleaning**
 Dielectric films
 Semiconductor device fabrication
 (pre-**cleaning** dielec. layers of substrates in
 semiconductor device fabrication)
 IT **Etching**
 (pre-**cleaning** dielec. layers of substrates in
 semiconductor device fabrication using)
 IT Metals, processes
 (pre-**cleaning** dielec. layers of substrates in
 semiconductor device fabrication using)
 IT Diffusion barrier
 (pre-**cleaning** dielec. layers of substrates in
 semiconductor device fabrication with)
 IT Polysiloxanes, processes
 (pre-**cleaning** dielec. layers of substrates in
 semiconductor device fabrication with)
 IT 7631-86-9, **Silica**, processes
 (carbon doped; pre-**cleaning** dielec. layers of
 substrates in semiconductor device fabrication with)
 IT 1333-74-0, **Hydrogen**, processes
 7440-37-1, **Argon**, processes 7440-59-7,
Helium, processes
 (in pre-**cleaning** dielec. layers of substrates in
 semiconductor device fabrication)
 IT 7440-44-0, **Carbon**, uses
 (**silica** dopant; pre-**cleaning** dielec. layers
 of substrates in semiconductor device fabrication with)

L33 ANSWER 3 OF 10 HCA COPYRIGHT 2001 ACS
 134:124767 In situ **plasma** wafer bonding method for
 semiconductor and other smooth materials. Farrens, Sharon N.;
 Roberds, Brian E. (Silicon Genesis Corporation, USA). U.S. US
 6180496 B1 20010130, 6 pp. (English). CODEN: USXXAM. APPLICATION:
 US 1998-143174 19980828. PRIORITY: US 1997-PV57413 19970829.
 AB A method is provided for chem. bonding semiconductor wafers and

other materials to each other without exposing wafers to wet environments, and a bonding chamber for in situ **plasma** bonding are disclosed. The in situ **plasma** bonding chamber allows **plasma** activation and bonding to occur without disruption of the vacuum level. This precludes rinsing of the surfaces after placement in the chamber, but allows for variations in ultimate pressure, **plasma** gas species, and backfill gases. The resulting bonded materials are free from macroscopic and microscopic voids. The initial bond is much stronger than conventional bonding techniques, thereby allowing for rougher materials to be bonded to each other. These bonded materials can be used for bond and **etchback** Si on insulator, high voltage and current devices, radiation resistant devices, micromachined sensors and actuators, and hybrid semiconductor applications. This technique is not limited to semiconductors. Any material with sufficiently smooth surfaces that can withstand the vacuum and **plasma** environments may be bonded in this fashion.

IT 7631-86-9, **Silica**, processes 12033-89-5,
Silicon nitride, processes
(In situ **plasma** wafer bonding method for semiconductor
and other smooth materials)
RN 7631-86-9 HCA
CN Silica (7CI, 8CI, 9CI) (CA INDEX NAME)

O=Si=O

RN 12033-89-5 HCA
CN Silicon nitride (Si3N4) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

IT 1333-74-0, **Hydrogen**, processes
7440-37-1, **Argon**, processes 7440-59-7,
Helium, processes
(plasma for semiconductor wafer bonding; In situ
plasma wafer bonding method for semiconductor and other
smooth materials)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H-H

RN 7440-37-1 HCA
CN Argon (8CI, 9CI) (CA INDEX NAME)

Ar

RN 7440-59-7 HCA
CN Helium (7CI, 8CI, 9CI) (CA INDEX NAME)

He

IC ICM H01L021-30
ICS H01L021-46

NCL 438455000

CC 76-3 (Electric Phenomena)

ST semiconductor material **plasma** wafer bonding

IT **Cleaning**

Electric insulators

Etching

Microactuators

Microsensors

SOI devices

Semiconductor device fabrication

Semiconductor materials

(In situ **plasma** wafer bonding method for semiconductor
and other smooth materials)

IT 1303-00-0, Gallium arsenide, processes 7440-21-3, Silicon,
processes 7631-86-9, Silica, processes

12033-89-5, Silicon nitride, processes

22398-80-7, Indium phosphide, processes

(In situ **plasma** wafer bonding method for semiconductor
and other smooth materials)

IT 1333-74-0, Hydrogen, processes

7440-37-1, Argon, processes 7440-59-7,

Helium, processes 7664-41-7, Ammonia, processes

7782-44-7, Oxygen, processes

(**plasma** for semiconductor wafer bonding; In situ

plasma wafer bonding method for semiconductor and other
smooth materials)

L33 ANSWER 4 OF 10 HCA COPYRIGHT 2001 ACS

133:186547 Reactive **plasma etch cleaning**

of high aspect ratio openings in semiconductor device fabrication..

Cohen, Barney M.; Su, Jingang; Ngan, Kenny King-tai (Applied

Materials, Inc., USA). U.S. US 6110836 A 20000829, 5 pp.

(English). CODEN: USXXAM. APPLICATION: US 1999-298065 19990422.

AB Native oxides (e.g., **silicon oxide**) can be

removed from a substrate having high aspect ratio openings therein

by using a **plasma** gas precursor mixt. of a reactive

halogen-contg. gas (e.g., nitrogen trifluoride) and a carrier gas

(e.g., **helium**). The lightwt. ions generated in the

plasma react with oxygen to produce very volatile

oxygen-contg. species that can be readily removed through the

exhaust system of the **plasma** chamber, preventing

re-deposition of oxides on the surface of the substrate or on the

sidewalls or bottom of the openings. When the substrate is mounted

in a **plasma** chamber having dual power sources that can form a **plasma** above the substrate and can apply bias to the substrate, tapered openings are formed rapidly that can be readily filled without forming voids.

IT 7440-59-7, **Helium**, uses
 (carrier gas; reactive **plasma etch**
 cleaning of high aspect ratio openings in semiconductor
 device fabrication)
 RN 7440-59-7 HCA
 CN Helium (7CI, 8CI, 9CI) (CA INDEX NAME)

He

IT 1333-74-0, **Hydrogen**, uses 7440-37-1,
Argon, uses
 (gas mixt. contg.; reactive **plasma**
 etch cleaning of high aspect ratio openings in
 semiconductor device fabrication)
 RN 1333-74-0 HCA
 CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H-H

RN 7440-37-1 HCA
 CN Argon (8CI, 9CI) (CA INDEX NAME)

Ar

IT 7631-86-9, **Silicon oxide**, processes
 (native oxide, removal of; reactive **plasma etch**
 cleaning of high aspect ratio openings in semiconductor
 device fabrication)
 RN 7631-86-9 HCA
 CN Silica (7CI, 8CI, 9CI) (CA INDEX NAME)

O=Si=O

IC ICM H01L021-00
 NCL 438710000
 CC 76-3 (Electric Phenomena)
 ST reactive **plasma etch cleaning** opening
 semiconductor device; RIE **cleaning** high aspect ratio
 opening
 IT Sputtering

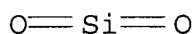
- (**etching**, reactive; reactive **plasma etch cleaning** of high aspect ratio openings in semiconductor device fabrication)
- IT Oxides (inorganic), processes
(native, removal of; reactive **plasma etch cleaning** of high aspect ratio openings in semiconductor device fabrication)
- IT **Cleaning**
Semiconductor device fabrication
(reactive **plasma etch cleaning** of high aspect ratio openings in semiconductor device fabrication)
- IT **Etching**
(sputter, reactive; reactive **plasma etch cleaning** of high aspect ratio openings in semiconductor device fabrication)
- IT 7440-59-7, **Helium**, uses
(carrier gas; reactive **plasma etch cleaning** of high aspect ratio openings in semiconductor device fabrication)
- IT 1333-74-0, **Hydrogen**, uses 7440-37-1, **Argon**, uses
(gas mixt. contg.; reactive **plasma etch cleaning** of high aspect ratio openings in semiconductor device fabrication)
- IT 56-23-5, Carbon tetrachloride, uses 75-73-0, Carbon tetrafluoride
2551-62-4, Sulfur hexafluoride 7783-54-2, Nitrogen trifluoride
10294-34-5, Boron trichloride
(gas mixt. contg.; reactive **plasma etch cleaning** of high aspect ratio openings in semiconductor device fabrication)
- IT 7631-86-9, **Silicon oxide**, processes
(native oxide, removal of; reactive **plasma etch cleaning** of high aspect ratio openings in semiconductor device fabrication)
- IT 7440-21-3, **Silicon**, uses
(reactive **plasma etch cleaning** of high aspect ratio openings in semiconductor device fabrication)

L33 ANSWER 5 OF 10 HCA COPYRIGHT 2001 ACS

129:75171 Dry-**etching** gas for oxide film, its **etching** method, and method of **cleaning** silicon. Saito, Hiroshi (Central Glass Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 10172957 A2 19980626 Heisei, 5 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1996-328847 19961209.

AB An **etching** gas, a mixt. of (1) a HF gas and (2) a gas which is excited and becomes **plasma** (a **plasma** gas), is claimed. The **plasma** gas may be Ar, He, Kr, Xe, or H. **Cleaning** of Si is carried out by (a) stopping supply of the HF gas after the dry-**etching**, and (b) leading only the **plasma** gas onto the Si substrate. Oxide film is completely removed without damaging Si substrate.

IT 7631-86-9, Silicon oxide, processes
(dry-etching gas contg. HF and plasma gas for
oxide film)
RN 7631-86-9 HCA
CN Silica (7CI, 8CI, 9CI) (CA INDEX NAME)



IT 1333-74-0, Hydrogen, uses 7440-37-1,
Argon, uses 7440-59-7, Helium, uses
(plasma gas; dry-etching gas contg.
HF and plasma gas for oxide film)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)



RN 7440-37-1 HCA
CN Argon (8CI, 9CI) (CA INDEX NAME)



RN 7440-59-7 HCA
CN Helium (7CI, 8CI, 9CI) (CA INDEX NAME)



IC ICM H01L021-3065
ICS C23C016-00; C23F004-00; H01L021-304
CC 76-3 (Electric Phenomena)
ST plasma gas dry etching oxide film; silicon
cleaning dry etching plasma gas;
hydrogen fluoride dry etching gas
IT Plasma etching
(dry-etching gas contg. HF and plasma gas for
oxide film)
IT Oxides (inorganic), processes
(dry-etching gas contg. HF and plasma gas for
oxide film)
IT Cleaning
(of silicon; dry-etching gas contg. HF and
plasma gas for oxide film)
IT 7664-39-3, Hydrogen fluoride, uses
(dry-etching gas contg. HF and plasma gas for

- oxide film)
IT 7631-86-9, Silicon oxide, processes
59763-75-6, Tantalum oxide 82867-87-6, Silicon fluoride oxide
(SiFO)
(dry-etching gas contg. HF and plasma gas for
oxide film)
IT 7440-21-3, Silicon, processes
(dry-etching gas contg. HF and plasma gas for
oxide film and cleaning of silicon)
IT 1333-74-0, Hydrogen, uses 7439-90-9, Krypton,
uses 7440-37-1, Argon, uses 7440-59-7,
Helium, uses 7440-63-3, Xenon, uses
(plasma gas; dry-etching gas contg.
HF and plasma gas for oxide film)

L33 ANSWER 6 OF 10. HCA COPYRIGHT 2001 ACS

125:290959 Method for plasma etching an
oxide/polycide structure and manufacture of a semiconductor
structure including this method. Costaganna, Pascal; Martinet,
Francois (International Business Machines Corp., USA; Ibm France).
PCT Int. Appl. WO 9627899 A1 19960912, 25 pp. DESIGNATED STATES: W:
JP, KR; RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC,
NL, PT, SE. (English). CODEN: PIXXD2. APPLICATION: WO 1996-EP922
19960305. PRIORITY: EP 1995-480015 19950308; EP 1995-480093
19950713.

- AB A semiconductor structure including a stack comprised of a cap
SiO₂ layer, a WSi₂ layer, and a bottom polysilicon layer
formed on a Si substrate coated with a thin oxide layer is patterned
in a 2-step plasma process with a resist stripping/
cleaning step between them. After a resist mask is formed
on the structure, the cap SiO₂ layer is etched
in a 1st chamber of a multichamber magnetically enhanced reactive
ion etching reactor using CHF₃, O₂, and Ar.
Then, the semiconductor structure is removed from the reactor. The
resist mask is eliminated by O₂ ashing and the wafer cleaned
using dil. HF (100:1). Next, the structure is introduced into a 2nd
chamber of the RIE reactor, and the WSi₂ and polysilicon layers are
etched in sequence using the patterned cap SiO₂
layer as a hard mask. A mixt. of HCl, Cl₂, and N₂, preferably with
a few ppm of O₂, is adequate for WSi₂ etching and a mixt.
of HCl, He, and He-O₂ is adequate for
polysilicon etching. The thin oxide layer is attacked to
a very small extent during this step. Finally, the semiconductor
structure is removed from the reaction chamber and is ready for
subsequent processing. The improved method is substantially
contamination-free and only requires 2 reaction chambers instead of
4. The improved etching method finds extensive
application in the semiconductor industry and in particular in the
formation of the gate conductor stack in 16-Mbit DRAM chips.
IT 7440-37-1, Argon, processes 7440-59-7,
Helium, processes
(plasma etching of oxide/polycide structures

in gas mixts. contg.)
 RN 7440-37-1 HCA
 CN Argon (8CI, 9CI) (CA INDEX NAME)

Ar

RN 7440-59-7 HCA
 CN Helium (7CI, 8CI, 9CI) (CA INDEX NAME)

He

IC ICM H01L021-321
 CC 76-11 (Electric Phenomena)
 ST **plasma etching** oxide polycide structure;
 semiconductor structure oxide polycide **plasma etching**

IT Ashing
 (of resist masks after **plasma etching** of
 oxide/polycide structures)

IT Semiconductor devices
 (**plasma etching** of oxide/polycide structures
 in semiconductor device manuf.)

IT Oxides, processes
 Silicides
 (**plasma etching** of oxide/polycide structures
 in semiconductor device manuf.)

IT Sputtering
 (**etching**, of oxide/polycide structures in semiconductor
 device manuf.)

IT Sputtering
 (**etching**, reactive, of oxide/polycide structures in
 semiconductor device manuf.)

IT Memory devices
 (random-access, **plasma etching** of
 oxide/polycide structures in manuf. of)

IT **Etching**
 (sputter, of oxide/polycide structures in semiconductor device
 manuf.)

IT **Etching**
 (sputter, reactive, of oxide/polycide structures in semiconductor
 device manuf.)

IT 7664-39-3, **Hydrogen** fluoride, **processes**
 (**cleaning** by; of semiconductor wafers after resist mask
 ashing)

IT 75-46-7, Fluoroform 7440-37-1, **Argon**, processes
 7440-59-7, **Helium**, processes 7647-01-0,
Hydrogen chloride, **processes** 7727-37-9,
 Nitrogen, processes 7782-44-7, Oxygen, processes 7782-50-5,

Chlorine, processes

(**plasma etching** of oxide/polycide structures
in gas mixts. contg.)

IT 12039-88-2, Tungsten disilicide
(**plasma etching** of oxide/polycide structures
in semiconductor device manuf.)

IT 7440-21-3, Silicon, processes
(polycryst.; **plasma etching** of oxide/polycide
structures in semiconductor device manuf.)

L33 ANSWER 7 OF 10 HCA COPYRIGHT 2001 ACS

125:263275 **Plasma etching** an oxide/polycide

structure. Costaganna, Pascal; Martinet, Francois (International
Business Machines Corp., USA). Eur. Pat. Appl. EP 731501 A1
19960911, 13 pp. DESIGNATED STATES: R: DE, FR, GB. (English).
CODEN: EPXXDW. APPLICATION: EP 1995-480015 19950308.

AB A semiconductor structure including a stack comprised of a cap
SiO₂ layer, a W silicide layer, and a bottom polysilicon
layer formed on a Si substrate coated with a thin oxide layer is
patterned in a 2-step **plasma** process with a resist
stripping/**cleaning** step between them. After a resist mask
is formed on top of the structure, the cap **SiO₂** layer is
etched as std. in a 1st chamber of a multichamber
magnetically enhanced RIE reactor using CHF₃, O₂, and **Ar**.
Then the semiconductor structure is removed from the reactor. The
resist mask is eliminated by O₂ ashing as std. and the wafer
cleaned using dil. HF (100:1). Next, the structure is
introduced into a 2nd chamber of the RIE reactor, and the WSi₂ and
polysilicon layers are **etched** in sequence using the
patterned cap **SiO₂** layer as a hard mask with adequate
chemistries. A mixt. of HCl, Cl₂, and N₂ is adequate for W silicide
etching and a mixt. of HCl, **He**, and **He**
-O₂ is adequate for polysilicon **etching**. The thin oxide
layer is attacked to a very small extent during this step. Finally,
the semiconductor structure is removed from the reaction chamber and
is ready for subsequent processing. The improved **etching**
method finds extensive application in the semiconductor industry and
in particular in the formation of the gate conductor stack in
16-Mbit DRAM chips.

IT 7631-86-9, Silica, processes
(magnetically enhanced RIE of)

RN 7631-86-9 HCA

CN Silica (7CI, 8CI, 9CI) (CA INDEX NAME)

O=Si=O

IT 7440-37-1, Argon, processes 7440-59-7,
Helium, processes
(reactive ion **etching** of oxide/polycide structures in
gas mixts. contg.)

RN 7440-37-1 HCA
CN Argon (8CI, 9CI) (CA INDEX NAME)

Ar

RN 7440-59-7 HCA
CN Helium (7CI, 8CI, 9CI) (CA INDEX NAME)

He

IC ICM H01L021-321
CC 76-3 (Electric Phenomena)
ST **plasma etching** oxide polycide structure;
reactive ion **etching** oxide polycide structure; tungsten
silicide reactive ion **etching**; **silica** reactive
ion **etching**; polysilicon reactive ion **etching**
IT **Cleaning**
(in **plasma etching** of oxide/polycide
structures)
IT Ashing
(of resist masks after reactive ion **etching** of
oxide/polycide structures)
IT Oxides, processes
Silicides
(**plasma etching** oxide/polycide structures)
IT Semiconductor devices
(**plasma etching** oxide/polycide structures in)
IT Sputtering
(**etching**, of oxide/polycide structures)
IT Sputtering
(**etching**, reactive, magnetically enhanced; of
oxide/polycide structures)
IT Memory devices
(random-access, reactive ion **etching** of oxide/polycide
structures in)
IT **Etching**
(sputter, of oxide/polycide structures)
IT **Etching**
(sputter, reactive, magnetically enhanced; of oxide/polycide
structures)
IT 7664-39-3, **Hydrogen** fluoride, **processes**
(**cleaning** by; of semiconductor wafers after reactive
ion **etching** of oxide/polycide structures)
IT 7631-86-9, **Silica**, processes 12039-79-1,
Tantalum silicide (TaSi₂) 12039-83-7, Titanium silicide (TiSi₂)
12039-88-2, Tungsten silicide 12039-90-6, Zirconium silicide
(ZrSi₂) 12136-78-6, Molybdenum silicide (MoSi₂)
(magnetically enhanced RIE of)

- IT 7440-21-3, Silicon, processes
(polycryst.; **plasma etching** oxide/polycide structures)
- IT 75-46-7, Fluoroform
(reactive ion **etching** of oxide/polycide structures in)
- IT 7440-37-1, Argon, processes 7440-59-7,
Helium, processes 7647-01-0, Hydrogen chloride,
processes 7727-37-9, Nitrogen, processes 7782-44-7,
Oxygen, processes 7782-50-5, Chlorine, processes
(reactive ion **etching** of oxide/polycide structures in
gas mixts. contg.)
- L33 ANSWER 8 OF 10 HCA COPYRIGHT 2001 ACS
124:304796 Induction **plasma** CVD or **etching** and
apparatus for same. Hata, Jiro; Hama, Kiichi; Ppongo, Toshiaki
(Tokyo Electron Ltd, Japan). Jpn. Kokai Tokkyo Koho JP 07312348 A2
19951128 Heisei, 12 pp. (Japanese). CODEN: JKXXAF. APPLICATION:
JP 1994-329329 19941201. PRIORITY: JP 1994-76727 19940323.
- AB The CVD or **etching** is achieved in a sealed vessel in which
.gtoreq.1 part of the wall surface comprises a dielec. substance by
applying a high frequency voltage to a dielec. means disposed at the
outside of the dielec. substance wall surface to form a
plasma of film-forming or **etching** gas(es) supplied
from a supplying means for film deposition on a substrate or for
etching a substrate; a nonfilm-forming gas(es) is supplied
between the dielec. substance inside surface and film-forming
gas-supplying means. The app. is also claimed.
- IT 12033-89-5, Silicon nitride, processes
(amorphous; **plasma** CVD app. with **plasma**
cleaning means for deposition of)
- RN 12033-89-5 HCA
CN Silicon nitride (Si3N4) (8CI, 9CI) (CA INDEX NAME)
- *** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
- IT 7631-86-9, Silicon dioxide, processes
(**plasma** CVD app. with **plasma cleaning**
means for deposition of)
- RN 7631-86-9 HCA
CN Silica (7CI, 8CI, 9CI) (CA INDEX NAME)

O=Si=O

- IT 1333-74-0, Hydrogen, processes
7440-37-1, Argon, processes 7440-59-7,
Helium, processes
(**plasma**; for **cleaning** inside vessel wall
dielec. substance surfaces of **plasma** CVD or
etching app.)
- RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H- H

RN 7440-37-1 HCA
CN Argon (8CI, 9CI) (CA INDEX NAME)

Ar

RN 7440-59-7 HCA
CN Helium (7CI, 8CI, 9CI) (CA INDEX NAME)

He

IC ICM H01L021-205
ICS H01L021-31; H05H001-46
CC 76-11 (Electric Phenomena)
ST **plasma** CVD **etching** nonfilm forming gas
IT Sputtering
(**etching**, with **plasma cleaning**
means using nonfilm-forming gases)
IT Vapor deposition processes
(**plasma**, with **plasma cleaning** means
using nonfilm-forming gases)
IT **Etching**
(sputter, with **plasma cleaning** means using
nonfilm-forming gases)
IT 7440-21-3, Silicon, processes 12033-89-5, **Silicon**
nitride, processes
(amorphous; **plasma** CVD app. with **plasma**
cleaning means for deposition of)
IT 7782-50-5, Chlorine, processes 10294-34-5, Boron chloride (BCl3)
(**etchant**, **plasma etching** of
aluminum substrate using)
IT 2551-62-4, Sulfur hexafluoride
(**etchant**, **plasma etching** of
amorphous silicon or **silicon nitride**
substrate using)
IT 75-73-0, Carbon tetrafluoride
(**etchant**, **plasma etching** of
amorphous silicon substrate using)
IT 7631-86-9, **Silicon dioxide**, processes
(**plasma** CVD app. with **plasma cleaning**
means for deposition of)
IT 7429-90-5, Aluminum, processes
(**plasma etching** of aluminum substrate using
chlorine and boron chloride **plasmas**)

IT 1333-74-0, Hydrogen, processes
 7440-37-1, Argon, processes 7440-59-7,
 Helium, processes 7727-37-9, Nitrogen, processes
 7782-44-7, Oxygen, processes
 (plasma; for cleaning inside vessel wall
 dielec. substance surfaces of plasma CVD or
 etching app.)

L33 ANSWER 9 OF 10 HCA COPYRIGHT 2001 ACS
 115:245143 Detrimental effects of low-pressure electron cyclotron
 resonance plasmas: impact on dry etching and
 dry cleaning. Ditizio, R. A.; Hallett, W. L.; Fonash, S.
 J. (Cent. Electron. Mater. Process., Pennsylvania State Univ.,
 University Park, PA, 16802, USA). Proc. - Electrochem. Soc.,
 91-9(Defects Silicon 2), 493-500 (English) 1991. CODEN: PESODO.
 ISSN: 0161-6374.

AB The effect were studied that low-pressure ECR plasma
 exposures can have on the integrity of thermally grown
 silicon dioxide. By using gas species which are
 typically found in a variety of dry etch and dry
 cleaning process chemistries, the repercussions were studied
 that may occur in ECR plasma-based processing of high
 quality oxides. After short exposure times, on the order of several
 minutes, significant shifts in the C-V characteristics occur in MOS
 structures fabricated on these exposed oxides.

IT 7631-86-9, Silica, uses and miscellaneous
 (cleaning and etching of, in ECR
 plasmas, detrimental effects during)

RN 7631-86-9 HCA

CN Silica (7CI, 8CI, 9CI) (CA INDEX NAME)

O=Si=O

IT 1333-74-0, Hydrogen, uses and miscellaneous
 7440-37-1, Argon, uses and miscellaneous
 7440-59-7, Helium, uses and miscellaneous
 (plasma cleaning and etching of
 silica by)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H-H

RN 7440-37-1 HCA

CN Argon (8CI, 9CI) (CA INDEX NAME)

Ar

RN 7440-59-7 HCA
CN Helium (7CI, 8CI, 9CI) (CA INDEX NAME)

He

CC 76-3 (Electric Phenomena)
Section cross-reference(s): 66
ST cyclotron resonance **plasma etching**
cleaning; silica plasma etching
cleaning; device silica plasma
etching cleaning
IT **Plasma**, chemical and physical effects
(**cleaning** of **silica** by)
IT Semiconductor devices
(from **plasma** cyclotron resonant processing of
silica)
IT Cyclotron resonance
(in **plasma etching** of silicon)
IT Sputtering
(**etching**, of **silica**, detrimental effects
during)
IT **Etching**
(sputter, of **silica**, detrimental effects during)
IT 7631-86-9, **Silica**, uses and miscellaneous
(**cleaning** and **etching** of, in ECR
plasmas, detrimental effects during)
IT 1333-74-0, Hydrogen, uses and miscellaneous
7440-37-1, **Argon**, uses and miscellaneous
7440-59-7, **Helium**, uses and miscellaneous
7782-44-7, Oxygen, uses and miscellaneous
(**plasma cleaning** and **etching** of
silica by)

L33 ANSWER 10 OF 10 HCA COPYRIGHT 2001 ACS

115:103055 Growth and characterization of undoped and in situ doped silicon-germanium on patterned oxide silicon substrates by very low pressure chemical vapor deposition at 700 and 625.degree.C. Tsai, Curtis; Jang, Syun Ming; Tsai, Julie; Reif, Rafael (Dep. Electr. Eng. Comput. Sci., Massachusetts Inst. Technol., Cambridge, MA, 02139, USA). J. Appl. Phys., 69(12), 8158-63 (English) 1991. CODEN: JAPIAU. ISSN: 0021-8979.

AB Results of strained layer Si1-xGex heteroepitaxy on patterned oxide Si substrates using a very low pressure chem. vapor deposition reactor are presented. Patterned oxide wafers were in situ **cleaned** at 700.degree. using an **Ar/H2** **plasma**. Undoped Si1-xGex strained layers at 625 and

700.degree. along with in situ doped p and n-type Si1-xGex strained layers at 625.degree. were deposited using SiH4, GeH4, B2H6, and AsH2 with H2 as a carrier gas. Alternating layers of Si1-xGex and Si were formed by switching the inlet gases. SEM showed a smooth surface morphol. for Si1-xGex strained layers deposited with GeH4/SiH4 gas ratios <7.5%. Cross-sectional TEM revealed a sharp transition between the Si1-xGex and Si layers with dislocation densities below the detection limit of 105 cm-2. Defect **etching** confirmed the low defect d. at the surface. For epitaxial windows smaller than 50 .times. 50 .mu.m, no defects were obsd. Ge solid mole fraction, B and As chem. dopant concns., and interfacial C and O contamination were measured by SIMS. Undoped, B2H6, and AsH3 in situ doped Si1-xGex strain layers with Ge content up to 23% were demonstrated. The Ge incorporation was controlled by the GeH4/SiH4 gas ratio and the Si1-xGex growth rate decreased with increasing Ge solid mole fraction. The addn. of B2H6 did not affect the Si1-xGex growth rate and modulation of **he** boron chem. incorporation was possible by controlling the B2H6 gas concn. On the other hand, AsH3 severely degraded the Si1-xGex growth rate and varying the AsH3 gas concn. did not change the arsenic chem. incorporation. Selective AsH3 doped Si1-xGex heteroepitaxy was obsd.

CC 75-1 (Crystallography and Liquid Crystals)

Section cross-reference(s): 76

IT 11126-22-0, **Silicon oxide**

(epitaxial growth of germanium silicon on patterned surface of)

IT 37380-03-3 135698-96-3 135698-97-4

(epitaxial growth of, on patterned **silicon oxide** substrate)

=> d 134 1-11 cbib abs hitind

L34 ANSWER 1 OF 11 HCA COPYRIGHT 2001 ACS

135:101183 **Plasma** surface treatment method and **plasma**

device for removing photoresist materials. Takamatsu, Toshi; Fujimura, Shuzo (Japan). U.S. Pat. Appl. Publ. US 20010008803 A1 20010719, 13 pp. (English). CODEN: USXXCO. APPLICATION: US 1999-268203 19990315. PRIORITY: US 1998-PV78321 19980317.

AB The present invention provides a method for treating a surface of an object using, for example, a downstream region of a **plasma** source. The method includes a step of generating a **plasma** from a gas-C in a **plasma** source, where the gas-C includes a gas-A and a gas-B. Gas-A is selected from a compd. comprising at least a N bearing compd. or an other gas. The other gas is selected from a mixt. of an element in Group 18 classified in the at. periodic table. Gas-B includes at least a NH3 bearing compd. The method also includes a step of injecting a gas-D downstream of the **plasma** source of the gas-C. The method also includes a step of setting an object (having a surface) downstream of the gas-D injection and downstream of the **plasma** source. A step of

processing the surface of the object by a mixt. species generated from the gas-C in the **plasma** and the gas-D is included. The NH₃ bearing compd. in the gas-C includes a NH₃ bearing concn. that is lower than an explosion limit of NH₃, which is safer than conventional techniques.

- IC ICM C23F001-02
ICS H01L021-302
- NCL 438706000
- CC 76-11 (Electric Phenomena)
- ST **plasma** device nitrogen compd noble gas photoresist; safety
plasma treatment
- IT Electric discharge devices
Photoresists
Plasma
(**plasma** surface treatment method and **plasma** device for removing photoresist materials)
- IT Alcohols, processes
Noble gases, processes
(**plasma** surface treatment method and **plasma** device for removing photoresist materials)
- IT 64-17-5, Ethanol, processes 7439-90-9, Krypton, processes
7440-01-9, Neon, processes 7440-37-1, Argon,
processes 7440-59-7, Helium, processes
7440-63-3, Xenon, processes 7664-41-7, Ammonia, processes
7664-41-7D, Ammonia, derivs. 7727-37-9, Nitrogen, processes
7727-37-9D, Nitrogen, compds. 7732-18-5, Water, processes
7783-54-2, Nitrogen fluoride (NF₃) 7803-62-5, Silane, processes
10043-92-2, Radon, processes 12385-13-6, Atomic **hydrogen**
, **processes**
(**plasma** surface treatment method and **plasma** device for removing photoresist materials)
- IT 7440-21-3, Silicon, processes 7631-86-9, **Silica**,
processes
(**plasma surface** treatment method and
plasma device for removing photoresist materials)
- L34 ANSWER 2 OF 11 HCA COPYRIGHT 2001 ACS
- 134:171254 The effects of **plasma** treatment on SiO₂ aerogel film using various reactive (O₂, H₂, N₂) and non-reactive (He, Ar) gases. Kim, J.-J.; Park, H.-H.; Hyun, S.-H. (Department of Ceramic Engineering, Yonsei University, Seodaemun-ku, Seoul, 120-749, S. Korea). Thin Solid Films, 377-378, 525-529 (English) 2000. CODEN: THSFAP. ISSN: 0040-6090. Publisher: Elsevier Science S.A..
- AB To reduce the R-C time delay of ULSI circuits, interconnection materials with low resistance and/or interlayer films with low dielec. const. should be applied. A SiO₂ aerogel film processed by spin-coating and supercrit. drying has high porosity and large integral surface area. Therefore, this material can offer a low dielec. const. Various gas **plasma** treatments can control the internal **surface** chem. species of SiO₂ aerogel film, such as org. groups, hydroxyl groups, and adsorbed

water. Through O₂, N₂, He, and Ar **plasma** treatments, condensation reaction between -OR and -OH groups happened and this induced the redn. of film thickness. After the treatments, -OH related bonds were formed due to adsorbed moisture. Therefore, the dielec. const. and the leakage current increased. However, the amelioration of elec. properties could be obtained after subsequent thermal treatment. On the contrary, a **H₂ plasma** treated SiO₂ aerogel film showed better leakage current behavior than that of the thermally treated one. This was due to the hydrophobic character of the **H₂ plasma** treated sample. The **H₂ plasma** was seemed to passivate porous SiO₂ aerogel film with hydrogen. Then **H₂ plasma** treatment was revealed as one possible post-treatment of the SiO₂ aerogel film for applying to an intermetal dielec. in a multilevel interconnection structure.

CC 76-2 (Electric Phenomena)

ST **plasma** treatment silica aerogel dielec interlayer ULSI interconnect

IT Integrated circuits
(ULSI; effects of **plasma** treatment on SiO₂ aerogel film for dielec. interlayer in ULSI interconnect using various reactive and non-reactive gases)

IT Aerogels
Dielectric constant
Electric insulators
Interconnections (electric)
Leakage current
Semiconductor device fabrication
Semiconductor devices
Surface area
(effects of **plasma** treatment on SiO₂ aerogel film for dielec. interlayer in ULSI interconnect using various reactive and non-reactive gases)

IT Coating process
(spin; effects of **plasma** treatment on SiO₂ aerogel film for dielec. interlayer in ULSI interconnect using various reactive and non-reactive gases)

IT 7631-86-9P, Silica, uses
(effects of **plasma** treatment on SiO₂ aerogel film for dielec. interlayer in ULSI interconnect using various reactive and non-reactive gases)

IT 1333-74-0, Hydrogen, reactions 7440-37-1, Argon, reactions 7440-59-7, Helium, reactions 7727-37-9, Nitrogen, reactions 7782-44-7, Oxygen, reactions
(effects of **plasma** treatment on SiO₂ aerogel film for dielec. interlayer in ULSI interconnect using various reactive and non-reactive gases)

L34 ANSWER 3 OF 11 HCA COPYRIGHT 2001 ACS

133:67409 Manufacture of bottom electrode of DRAM electric capacitor.
You, Cui Rong; Fuang, Guo Tai; Lu, Huo Tie (Lien Hua Electronics

Co., Ltd., Taiwan). Jpn. Kokai Tokkyo Koho JP 2000174231 A2 20000623, 6 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1998-348252 19981208.

- AB The method comprises forming a dielec. substance layer (e.g., **SiO₂**) on a **substrate**, forming openings for the node contact point, vapor depositing doped Si in the openings to form an node contact points, forming a B₂H₆-, PH₃-, or AsH₃-doped amorphous Si layer on the dielec. substance layer and the node contact points by **plasma**-enhanced CVD, and patterning the amorphous Si layer to form the bottom electrode.
- IC ICM H01L027-108
ICS H01L021-8242; H01L021-285; H01L027-04; H01L021-822
- CC 76-10 (Electric Phenomena)
- IT Vapor deposition process
(**plasma**; manuf. of bottom electrode of DRAM elec. capacitor by patterning doped amorphous silicon layer formed by)
- IT 1333-74-0, **Hydrogen**, uses 7440-37-1, **Argon**, uses 7440-59-7, **Helium**, uses
(carrier **gas**; manuf. of bottom electrode of DRAM elec. capacitor by patterning doped amorphous silicon layer formed by **plasma** CVD)
- L34 ANSWER 4 OF 11 HCA COPYRIGHT 2001 ACS
- 133:62600 Synthesis of crystalline carbon nitride film by microwave **plasma** chemical vapor deposition. Tian, Zhongzhuo; Yuan, Lei; Gu, Yousong; Duan, Zhenjun; Chang, Xiangrong; Zhao, Minxue (Institute of Physics, Chinese Academy of Sciences, Peop. Rep. China). Faming Zhuanli Shenqing Gongkai Shuomingshu CN 1219604 A 19990616, 15 pp. (Chinese). CODEN: CNXXEV. APPLICATION: CN 1997-121868 19971211.
- AB The process comprises: pretreating **substrate** (Si, **SiO₂**, Pt, Ta, Mo, Ni, etc.) by chem. cleaning and polishing, placing the substrate onto quartz support, placing the support in quartz tube, sealing, vacuumizing, introducing working gas into quartz tube, adjusting pressure in the quartz tube to 15-30 torr, opening microwave source to ionize the working gas to produce **plasma**, and depositing C₃N₄ film onto the substrate, where the working gas contains C-contg. gas at flow rate 0.2-5 cm³/min and N-contg. gas at flow rate 20-100 cm³/min; and the substrate temp. is 700-950.degree.. Preferably, Pt substrate is annealed in inert gas at 800-1000.degree. for 10-30 min before deposition; Si substrate is pre-treated by ultrasound in deionized water contg. 0.5-1 .mu.m diamond powder; the C-contg. gas includes CH₄, CO, and C₂H₂; the N-contg. gas includes N₂ and NH₃; and auxiliary **gas** (**Ar**, **H**, or **He**) is used with working gas at flow rate 0-80 cm³/min. The app. used in the synthesis consists of microwave system, gas supplying system, vacuum system, and temp. measurement system.
- IC ICM C23C016-36
- CC 57-8 (Ceramics)
- Section cross-reference(s): 47, 76
- ST carbon nitride cryst film microwave **plasma** CVD

- IT Vapor deposition process
(**plasma**; synthesis of cryst. carbon nitride film by microwave **plasma** chem. vapor deposition)
- IT Films
Microwave
(synthesis of cryst. carbon nitride film by microwave **plasma** chem. vapor deposition)
- IT 7439-98-7, Molybdenum, processes 7440-02-0, Nickel, processes
7440-06-4, Platinum, processes 7440-21-3, Silicon, processes
7440-25-7, Tantalum, processes 7631-86-9, Silica
, processes
(**substrate**; for synthesis of cryst. carbon nitride film by microwave **plasma** chem. vapor deposition)
- IT 154769-61-6, Carbon nitride
(synthesis of cryst. carbon nitride film by microwave **plasma** chem. vapor deposition)
- IT 74-82-8, Methane, processes 74-86-2, Acetylene, processes
630-08-0, Carbon monoxide, processes 7664-41-7, Ammonia, processes
7727-37-9, Nitrogen, processes
(working gas contg.; for synthesis of cryst. carbon nitride film by microwave **plasma** chem. vapor deposition)
- L34 ANSWER 5 OF 11 HCA COPYRIGHT 2001 ACS
123:235949 Manufacture of silica protective film by **plasma**
chemical vapor deposition. Ito, Kazuyuki; Nakamura, Kyuzo;
Ishikawa, Michio; Togawa, Atsushi; Tani, Noriaki; Hashimoto,
Yukinori; Oohashi, Yumiko (Ulvac Corp, Japan; Brother Ind Ltd).
Jpn. Kokai Tokkyo Koho JP 07187644 A2 19950725 Heisei, 7 pp.
(Japanese). CODEN: JKXXAF. APPLICATION: JP 1993-335714 19931228.
- AB The SiO₂ protective film is manufd. by **plasma** chem. vapor
depositing using org. oxysilanes and **Ar**, **He**, or
NH₃ as decompn. aids to prevent ashing by O radicals. Ashing of a
substrate was prevented.
- IC ICM C01B033-12
ICS C08J007-06; G11B005-72; G11B005-84; G11B007-26
- CC 57-2 (Ceramics)
- ST **plasma** CVD silica protective film; **argon**
plasma CVD silica film; **helium plasma**
CVD silica film; ammonia **plasma** CVD silica film
- IT Vapor deposition processes
(**plasma** CVD of silica protective film for prevention of
ashing by oxygen **plasma**)
- IT Acrylic polymers, miscellaneous
Epoxy resins, miscellaneous
Polycarbonates, miscellaneous
(**substrates**; **plasma** CVD of silica
protective film for prevention of ashing by oxygen **plasma**
)
- IT 7631-86-9P, Silica, preparation
(**plasma** CVD of silica protective film for prevention of
ashing by oxygen **plasma**)
- IT 75-73-0, Tetrafluoromethane 1333-74-0, Hydrogen,

- processes 7440-37-1, Argon, processes
 7440-59-7, Helium, processes 7664-41-7, Ammonia,
 processes 7782-44-7, Oxygen, processes 7783-54-2, Nitrogen
 trifluoride 10024-97-2, Nitrogen oxide (N₂O), processes
 (plasma CVD of silica protective film for prevention of
 ashing by oxygen plasma)
- IT 78-10-4, Tetraethoxysilane 681-84-5, Tetramethoxysilane
 (plasma CVD of silica protective film for prevention of
 ashing by oxygen plasma)
- L34 ANSWER 6 OF 11 HCA COPYRIGHT 2001 ACS
 122:328515 Treatment of foreign material on a surface. Elliott, David
 J.; Hollman, Richard F.; Yans, Francis M.; Singer, Daniel K. (Uvtech
 Systems, Inc., USA). PCT Int. Appl. WO 9507152 A1 19950316, 99 pp.
 DESIGNATED STATES: W: AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ,
 DE, DK, ES, FI, GB, GE, HU, JP, KE, KG, KP, KR, KZ, LK, LT, LU, LV,
 MD, MG, MN, MW, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SI, SK, TJ, TT,
 UA, US, UZ, VN; RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU,
 MC, NL, PT, SE. (English). CODEN: PIXXD2. APPLICATION: WO
 1994-US9996 19940902. PRIORITY: US 1993-118806 19930908; US
 1994-298023 19940829.
- AB Foreign material on a surface of a substrate, esp. a semiconductor
 wafer or magnetic recording head, is processed to form a reaction
 product, by the combination of providing a directed flow of a fluid,
 including a reactant, in the vicinity of the foreign material, and
 delivering a beam of radiation to aid the reactant to react with the
 foreign material to form the reaction product.
- IC ICM B08B003-00
 ICS B08B005-00; B08B005-04; B08B007-00; B44C001-22; C23F001-00
- CC 76-3 (Electric Phenomena)
 Section cross-reference(s): 77
- IT Plasma
 Sound and Ultrasound
 (treatment of foreign material on surfaces by)
- IT 1333-74-0, Hydrogen, processes
 7440-37-1, Argon, processes 7440-59-7,
 Helium, processes 7664-41-7, Ammonia, processes
 7727-37-9, Nitrogen, processes 10024-97-2, Nitrogen oxide (N₂O),
 processes
 (treatment of foreign material on a surface by fluids
 contg.)
- IT 7440-21-3, Silicon, processes 7631-86-9, Silica,
 processes
 (treatment of surfaces contaminated with)
- L34 ANSWER 7 OF 11 HCA COPYRIGHT 2001 ACS
 121:48380 Process and etchant system for plasma etching a
 multilayer substrate. Cathey, David A. (Micron Technology, Inc.,
 USA). U.S. US 5314578 A 19940524, 5 pp. (English). CODEN:
 USXXAM. APPLICATION: US 1992-904463 19920625.
- AB A C-contg., chem.-etchant-protective, patterned layer is formed on a
 multilayer substrate including a SiO₂ layer

formed on an underlying Si or metal silicide layer by providing a predetd. pattern defining a plurality of openings in the C-contg. layer. Next, the exposed areas of the major **surface** of the SiO₂ structural layer are selectively etched with a substantially C-free chem. etchant system comprising a halogen-contg. material and a H-contg. material. These materials form a polyhalocarbon material in the presence of a C-contg. material. Thus, since the chem.-etchant-protective patterned layer is C-contg., a localized polyhalocarbon deposition can be affected, at high selectivity conditions, by adding the C-free chem. etchant system in the presence of the protective patterned layer. More specifically, the H-contg. material reacts with the C-free, halogen-contg. material and the C-contg. patterned layer to selectively form in situ a polyhalocarbon protective coating on the SiO₂ structural layer.

IC ICM H01L021-00

NCL 156662000

CC 76-3 (Electric Phenomena)

ST **plasma** etching multilayer substrate; silica layer
plasma etching; halogen hydrogen contg etchant multilayer substrate

IT 1333-74-0, Hydrogen, uses 2551-62-4, Sulfur fluoride (SF₆)
7439-90-9, Krypton, uses 7440-01-9, Neon, uses 7440-37-1
, Argon, uses 7440-59-7, Helium, uses
7440-63-3, Xenon, uses 7664-39-3, Hydrogen fluoride, uses
7664-41-7, Ammonia, uses 7727-37-9, Nitrogen, uses 7782-41-4,
Fluorine, uses 7783-54-2, Nitrogen fluoride (NF₃)
(etchant contg., for **plasma** etching of multilayer
substrates)

IT 7631-86-9, Silica, reactions
(**plasma** etching of multilayer substrates contg.)

L34 ANSWER 8 OF 11 HCA COPYRIGHT 2001 ACS

117:75105 Polycrystalline diamond tools and their manufacture. Tanabe, Keiichiro; Fujimori, Naoji (Sumitomo Electric Industries, Ltd., Japan). Eur. Pat. Appl. EP 487292 A1 19920527, 28 pp. DESIGNATED STATES: R: DE, ES, FR, GB, NL, SE. (English). CODEN: EPXXDW. APPLICATION: EP 1991-310636 19911119. PRIORITY: JP 1990-319210 19901122.

AB Polycryst. diamond having impurity concn. changes in the thickness is used in the manuf. of cutting tools or abrasion-resistance tools. The concn. of impurity in the diamond is lower at the rake surface than that at the fixation surface. C-contg. gas, e.g., CH₄, **H gas**, and powder of impurity, e.g., WF₆, are introduced into a vacuum chamber and the material gas is excited by **plasma** or radicals and deposited on the heated substrate, e.g., W, along with the powder impurity. The deposition process is repeated with increasing the ratio of impurity in the material gas until the diamond becomes >40 .mu.m in thickness. Owing to the higher impurity concn. of diamond near the fixation surface, the diamond tool excels in chip resistance or toughness.

IC ICM C23C016-00

ICS C23C016-26
CC 57-8 (Ceramics)
IT Halogens
Helium-group gases, uses
 (in manuf. of polycryst. diamond having nonuniform impurity
 concn. in thickness direction, for cutting tools)
IT 1333-74-0, Hydrogen, uses 7440-37-1, Argon
 , uses 7440-59-7, Helium, uses 7727-37-9,
Nitrogen, uses 7782-41-4, Fluorine, uses
 (in manuf. of polycryst. diamond having nonuniform impurity
 concn. in thickness direction, for cutting tools).
IT 1344-28-1, Alumina, uses 7440-32-6, Titanium, uses
7631-86-9, Silica, uses 10043-11-5, Boron
nitride (BN), uses 12033-89-5, Silicon
nitride, uses 12069-32-8, Boron carbide (B4C)
12069-89-5, Molybdenum carbide (Mo2C) 12070-06-3, Tantalum carbide
(TaC) 12070-08-5, Titanium carbide (TiC) 12070-12-1, Tungsten
carbide (WC) 12070-13-2, Tungsten carbide (W2C) 24304-00-5,
Aluminum nitride 25583-20-4, Titanium nitride (TiN)
 (**substrate**, in manuf. of polycryst. diamond having
 nonuniform impurity concn. in thickness direction, for cutting
 tools)

L34 ANSWER 9 OF 11 HCA COPYRIGHT 2001 ACS
112:82895 Method for etching silicon nitride films. Loewenstein, Lee M.
 (Texas Instruments Inc., USA). U.S. US 4857140 A 19890815, 9 pp.
 Cont.-in-part of U.S. Ser. No. 73,937, abandoned. (English).
 CODEN: USXXAM. APPLICATION: US 1988-175474 19880331. PRIORITY: US
 1987-73937 19870716; US 1987-75017 19870716.
AB The title process comprises (a) placing the films in a low-pressure
 chamber, (b) generating free radicals from a F-contg. gas, e.g.,
 CF4, F2, SF6, CFH3, or C2F6, and an inert carrier selected from
 He, Ar, and N in a **plasma** generator
 remote from the process chamber, and (c) introducing the **gas**
 , and a **H** source selected from CH4, **H2**, NH3,
 hydrocarbons, and any abstractable H atoms into the low-pressure
 chamber contg. the films. This method minimizes surface damage, and
 is esp. suitable for the etching of **Si nitride**
 on semiconductor **wafers**.
IC ICM B44C001-22
ICS C03C015-00; C03C025-06
NCL 156643000
CC 57-2 (Ceramics)
Section cross-reference(s): 76
ST silicon nitride film etching semiconductor; radical **plasma**
hydrogen etching; inert gas carrier **plasma**; **helium**
carrier **plasma**; **argon** carrier **plasma**;
nitrogen carrier **plasma**; nitrogen trifluoride radical;
carbon tetrafluoride radical; fluorine radical; sulfur hexafluoride
radical; hexafluoroethane radical; tetrafluoromethane radical;
trifluoromethane radical; methane hydrogen; ammonia hydrogen;
hydrocarbon hydrogen

- IT Helium-group gases, uses and miscellaneous
(carrier gas, in **plasma** etching of silicon nitride films on semiconductors, for minimized surface damage)
- IT Hydrocarbons, uses and miscellaneous
(hydrogen source, **plasma** contg., etching with, of silicon nitride films on semiconductors, for minimized surface damage)
- IT Semiconductor materials
(silicon nitride films on, **plasma** etching of, with free radicals in presence of hydrogen, for minimized surface damage)
- IT 7440-37-1, Argon, uses and miscellaneous
7440-59-7, Helium, uses and miscellaneous
7727-37-9, Nitrogen, uses and miscellaneous
(carrier gas, in **plasma** etching of silicon nitride films on semiconductors, for minimized surface damage)
- IT 75-46-7D, Trifluoromethane, radicals 75-73-0D, Carbon tetrafluoride, radicals 76-16-4D, Hexafluoroethane, radicals 2551-62-4D, Sulfur hexafluoride, radicals
(etching with, **plasma**, in presence of hydrogen, of silicon nitride films on semiconductors, for minimized surface damage)
- IT 7782-41-4D, Fluorine, radicals, reactions 7783-54-2D, Nitrogen trifluoride, radicals
(etching with, **plasma**, in presence of hydrogen, of silicon nitride films on semiconductors, for minimized surface damage)
- IT 12033-89-5, Silicon nitride, uses and miscellaneous
(films, **plasma** etching of, on semiconductors, with free radicals in presence of hydrogen, for minimized surface damage)
- IT 74-82-8, Methane, uses and miscellaneous 7664-41-7, Ammonia, uses and miscellaneous
(hydrogen source, **plasma** contg., etching with, of silicon nitride films on semiconductors, for minimized surface damage)
- IT 1333-74-0, Hydrogen, uses and miscellaneous
(**plasma** contg., etching with, of silicon nitride films on semiconductors, for minimized surface damage)

L34 ANSWER 10 OF 11 HCA COPYRIGHT 2001 ACS

101:162394 Magnetic and crystalline properties of ion-implanted garnet films with **plasma** exposure. Betsui, K.; Miyashita, T.; Komenou, K. (Fujitsu Lab., Atsugi, 243-01, Japan). IEEE Trans. Magn., MAG-20(5 Pt. 1), 1117-19 (English) 1984. CODEN: IEMGAQ. ISSN: 0018-9464.

AB The implantation-induced anisotropy field change, .DELTA.Hk, and lattice strain, .DELTA.d/d, in ion implanted films were enhanced considerably by exposing films to **plasma** of H₂, He, Ne and Ar gases at a substrate temp. >100.degree.. The enhanced .DELTA.Hk is twice as large as the as-implanted value in typical expts., and it is comparable to the .DELTA.Hk of the H ion implanted layer. The enhanced .DELTA.Hk of the exposed film decreases greatly with increasing annealing temp.,

but this can be prevented by coating the **surface** with a **SiO₂** layer. The changes of .DELTA.Hk profiles in **plasma** exposure were obtained by using ferromagnetic resonance technique. .DELTA.Hk is enhanced not only at the surface but also deep in the implanted layer. This effect is probably due to the diffusion of the residual H into the implanted layer.

CC 77-3 (Magnetic Phenomena)

Section cross-reference(s): 75

ST anisotropy field implanted garnet; garnet anisotropy **plasma** effect; strain implanted garnet **plasma** effect

IT Magnetic anisotropy

(of yttrium samarium lutetium calcium germanium iron garnet ion-implanted films, **plasma** exposure effect on)

IT **Plasma**, chemical and physical effects

(on magnetic anisotropy and lattice strain of ion-implanted rare earth garnet films)

IT 11112-62-2D, solid solns. with yttrium samarium lutetium iron garnets 12023-71-1D, solid solns. with yttrium samarium calcium germanium iron garnets 12023-73-3D, solid solns. with yttrium lutetium calcium germanium iron garnets 12063-56-8D, solid solns. with samarium lutetium calcium germanium iron garnets (magnetic anisotropy and lattice strain of ion-implanted, **plasma** exposure effect on)

IT 12586-59-3, chemical and physical effects 14782-23-1, properties (magnetic anisotropy and lattice strain of yttrium samarium lutetium calcium germanium iron garnets implanted with, **plasma** exposure effect on)

IT 1333-74-0, properties 7440-01-9, properties

7440-37-1, properties 7440-59-7, properties

(**plasma**, magnetic anisotropy and lattice strain of ion-implanted rare earth garnet films exposed to)

L34 ANSWER 11 OF 11 HCA COPYRIGHT 2001 ACS

101:162288 Selectively etching silicon dioxide with sulfur hexafluoride/nitriding component gas. Bobbio, Stephen M.; Flanigan, Marie C.; Thrun, Kenneth M. (Allied Corp., USA). U.S. US 4465552 A 19840814, 4 pp. (English). CODEN: USXXAM. APPLICATION: US 1983-522437 19830811.

AB SiO₂ is selectively etched preferentially over Si or poly-Si in an article contg. a layer of **SiO₂** on an **underlayer** of Si or poly-Si by exposing the article to a low-pressure **plasma** gas mixt. discharge. The **plasma** comprises SF₆ and a nitriding component (e.g. NH₃) in the gaseous phase and the exposure is continued until the SiO₂ layer is penetrated. The ratio of SF₆ to NH₃ is from 17:3 to 1:2. At about 14% NH₃, the rates are equiv. for Si and oxide. For higher nitriding gas fraction, the SiO₂ rate dominates. The optional addn. of an inert diluent gas (Hr, **He**) does not change these results. The addn. of H to the mixt. retards the Si etch rate still further and may increase selectivity. The **plasma gas** incorporates **H** in a proportion by partial pressures to the nitriding component of from .apprx.7:3 to .apprx.1:2.

IC H01L021-306; B44C001-22; C03C015-00; C03C025-06
NCL 156643000
CC 76-11 (Electric Phenomena)
IT Nitridation
 (agents, **plasma** from sulfur hexafluoride and, in
 selective etching of silica over silicon)
IT 7440-21-3, uses and miscellaneous
 (etching of silica selectively in presence of, **plasma**
 from sulfur hexafluoride and ammonia in)
IT 7631-86-9, reactions
 (etching of, preferentially silicon or polycryst. silicon,
 plasma from sulfur hexafluoride and ammonia in)
IT 1333-74-0, uses and miscellaneous 7440-37-1, uses
and miscellaneous 7440-59-7, uses and miscellaneous
 (in **plasma** selective etching of silica over silicon in
 sulfur hexafluoride-ammonia mixt.)
IT 2551-62-4
 (**plasma** from ammonia and, in preferential etching of
 silica over silicon)
IT 7664-41-7, uses and miscellaneous
 (**plasma** from sulfur hexafluoride and, in selective
 etching of silica over silicon)

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L35 ANSWER 1 OF 11 HCA COPYRIGHT 2001 ACS

135:188079 Device and method for carrying out **plasma** enhanced
surface treatment of substrates in a vacuum. Wanka, Harald; Weber,
Klaus; Roehlecke, Soeren; Steinke, Olaff; Schade, Klaus (Robert
Bosch G.m.b.H., Germany; Fap G.m.b.H.). PCT Int. Appl. WO
2001063003 A1 20010830, 15 pp. DESIGNATED STATES: W: JP, US; RW:
AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT,
SE, TR. (German). CODEN: PIXXD2. APPLICATION: WO 2001-DE730
20010226. PRIORITY: DE 2000-10010016 20000226.

AB The invention relates to a device and method for carrying out
plasma enhanced surface treatment of substrates in a vacuum.
According to the invention, homogeneous, contamination-free layers
should be produced on substrate surfaces, and the unwanted coating
inside vacuum coating installations can be prevented with little
effort. In addn., **etching** processes for processing the
substrates or for the **plasma**-chem. **cleaning** of
the reactor should not lead to any corrosion or to the pptn. of
etching products inside the vacuum chamber. To these ends,
a reaction chamber is placed inside a vacuum chamber. The reaction
chamber in which the actual surface treatment is carried out is
addnl. surrounded by a purge chamber. A purge gas is fed through
the purge chamber via connections and is carried away again. The
purge chamber can completely surround the reaction chamber. It is
sufficient, however, if the purge chamber is placed solely on
sealing surfaces of the reaction chamber.

- IC ICM C23C016-44
ICS C23C016-455; H01J037-32; C30B025-14
- CC 75-1 (Crystallography and Liquid Crystals)
Section cross-reference(s): 66, 76
- ST substrate vacuum **plasma** enhanced surface treatment
- IT **Etching**
Vapor deposition process
(**plasma**; device and method for carrying out
plasma enhanced surface treatment of substrates in a
vacuum)
- IT Vapor deposition process
(vacuum; device and method for carrying out **plasma**
enhanced surface treatment of substrates in a vacuum)
- IT 7782-44-7, Oxygen, processes 10024-97-2, Nitrous oxide, processes
(vapor deposition process gas; device and method for carrying out
plasma enhanced surface treatment of substrates in a
vacuum)
- IT 56-23-5, Tetrachloromethane, reactions 75-73-0, Tetrafluoromethane
2551-62-4, Sulfur hexafluoride 7550-45-0, Titanium chloride,
reactions 7783-54-2, Nitrogen trifluoride 7803-62-5, Silane,
reactions 10026-04-7, Tetrachlorosilane
(vapor deposition process gas; device and method for carrying out
plasma enhanced surface treatment of substrates in a
vacuum)
- IT 124-38-9, Carbon dioxide, processes 1333-74-0,
Hydrogen, processes 7440-37-1,
Argon, processes 7440-59-7, **Helium**,
processes 7727-37-9, Nitrogen, processes
(vapor deposition purging gas; device and method for carrying out
plasma enhanced surface treatment of substrates in a
vacuum)
- L35 ANSWER 2 OF 11 HCA COPYRIGHT 2001 ACS
- 135:12127 Supercritical compositions for removal of organic material and
methods of using same. Vaartstra, Brian A. (Micron Technology,
Inc., USA). U.S. US 6242165 B1 20010605, 10 pp. (English). CODEN:
USXXAM. APPLICATION: US 1998-141866 19980828.
- AB The invention relates to treating of surfaces of an object, e. g.,
treating wafer surfaces in the fabrication of semiconductor devices
and to removal of org. material, e. g., **etching** or
cleaning of resists, org. residues, etc., from surfaces
using supercrit. compo. A method for removing org. material in the
fabrication of structures includes providing a substrate assembly
having an exposed org. material and removing at least a portion of
the exposed org. material using a compn. having .gtoreq.1 component
in a supercrit. state. The compn. includes an oxidizer selected
from the group of S trioxide (SO3), SO2 (SO2), nitrous oxide (N2O),
NO, NO2, ozone (O3), H2O2 (H2O2), F2, Cl2, Br2, and O (O2). For
example, the exposed org. material may be selected from the group of
resist material, photoresist residue, UV-hardened resist, x-ray
hardened resist, C-F contg. polymers, **plasma etch**
residues, and org. impurities from other processes. The .gtoreq.1

component in a supercrit. state may be an oxidizer selected from the group of S trioxide (SO₃), SO₂ (SO₂), nitrous oxide (N₂O), NO, NO₂, ozone (O₃), H₂O₂ (H₂O₂), F₂, Cl₂, Br₂, and O (O₂); preferably S trioxide. Further, the compn. may include a supercrit. component in a supercrit. state selected from the group of CO₂ (CO₂), NH₃ (NH₃), H₂O, nitrous oxide (N₂O), CO, inert gases e.g., N (N₂), **He**, Ne, **Ar**, Kr, and Xe; preferably CO₂. Further, org. material removal compns. for performing such methods are provided.

IC ICM G03F007-42

NCL 430329000

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 76

IT **Etching**

Oxidizing agents

Photoresists

(supercrit. compns. for removal of org. material contg. supercrit. component)

IT 7446-09-5, Sulfur dioxide, processes 7722-84-1, **Hydrogen** peroxide, **processes** 7726-95-6, Bromine, processes 7782-41-4, Fluorine, processes 7782-44-7, Oxygen, processes 7782-50-5, Chlorine, processes 10024-97-2, Nitrous oxide, processes 10028-15-6, Ozone, processes 10102-43-9, Nitrogen monoxide, processes 10102-44-0, Nitrogen oxide (NO₂), processes (supercrit. compns. for removal of org. material contg. oxidizer)

L35 ANSWER 3 OF 11 HCA COPYRIGHT 2001 ACS

133:255504 Method for **plasma** pretreatment. Anon. (UK). Res. Discl., 436(Aug.), P1324 (No. 436003) (English) 2000. RD 436003 20000810. CODEN: RSDSBB. ISSN: 0374-4353. PRIORITY: RD 2000-436003 20000810. Publisher: Kenneth Mason Publications Ltd..

AB A new method to **clean** substrates to be coated by a **plasma** process is disclosed and preferred process range on metals and hard materials are outlined. In a vacuum chamber H₂ or noble gases (**Ar**, **He**, Kr) atm. the substrates (tools or machine parts) are exposed to ion bombardment. In the following the **cleaning/etching** process is interrupted and a **plasma** assisted coating process can be started, favorably within the same vacuum chamber. Optionally process steps like heating, **cleaning/etching**, and coating can be supported by magnetic fields to conc. or distribute **plasmas** more uniformly.

CC 56-6 (Nonferrous Metals and Alloys)

ST metal **plasma cleaning** coating

IT Coating process

Ion bombardment

(method for **plasma** pretreatment of metals prior to coating)

IT Alloys, processes

Metals, processes

(method for **plasma** pretreatment of metals prior to coating)

IT **Cleaning**

(**plasma**; method for **plasma** pretreatment of metals prior to coating)

L35 ANSWER 4 OF 11 HCA COPYRIGHT 2001 ACS

133:11811 **Plasma precleaning with argon, helium, and hydrogen gases** in forming interconnections of integrated circuits. Cohen, Barney M.; King-Tai, Ngan Kenny; Li, Xiangbing (Applied Materials, Inc., USA). PCT Int. Appl. WO 2000034997 A1 20000615, 21 pp. DESIGNATED STATES: W: JP, KR; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (English). CODEN: PIXXD2. APPLICATION: WO 1999-US27829 19991123. PRIORITY: US 1998-206027 19981204.

AB The present invention provides a method and app. for **precleaning** a patterned substrate with a **plasma** comprising a mixt. of **argon, helium, and hydrogen**. Addn. of **helium** to the gas mixt. of **argon** and hydrogen surprisingly increases the **etch** rate in comparison to **argon/hydrogen** mixts. **Etch** rates are improved for **argon** concns. below about 75 % by vol. RF power is capacitively and inductively coupled to the **plasma** to enhance control of the **etch** properties. **Argon, helium, and hydrogen** can be provided as sep. gases or as mixts.

IC ICM H01L021-311

ICS H01L021-768

CC 76-3 (Electric Phenomena)

ST **plasma precleaning argon**

helium hydrogen gas; integrated circuit interconnection formation **plasma precleaning**

IT Vapor deposition process

(chem.; **plasma precleaning with argon and helium and hydrogen gases** in forming interconnections of integrated circuits)

IT Vapor deposition process

(phys.; **plasma precleaning with argon and helium and hydrogen gases** in forming interconnections of integrated circuits)

IT Electric conductors

Electric contacts

Electric insulators

Inductively coupled **plasma**

Integrated circuits

Interconnections (electric)

Plasma

(**plasma precleaning with argon and helium and hydrogen gases** in forming interconnections of integrated circuits)

IT **Etching**

(**plasma; plasma precleaning with argon and helium and hydrogen gases** in forming interconnections of integrated circuits)

- IT **Cleaning**
 (pre-; **plasma precleaning** with **argon** and **helium** and **hydrogen gases** in forming interconnections of integrated circuits)
- IT 1333-74-0, **Hydrogen**, uses 7440-37-1, **Argon**, uses 7440-59-7, **Helium**, uses (gas mixts. contg.; **plasma precleaning** with **argon** and **helium** and **hydrogen gases** in forming interconnections of integrated circuits)
- IT 7429-90-5, Aluminum, processes 7440-21-3, Silicon, processes 7440-25-7, Tantalum, processes 7440-33-7, Tungsten, processes 7440-50-8, Copper, processes 7440-56-4, Germanium, processes 12033-62-4, Tantalum nitride (TaN) 25583-20-4, Titanium nitride (TiN)
 (plasma precleaning with **argon** and **helium** and **hydrogen gases** in forming interconnections of integrated circuits)
- L35 ANSWER 5 OF 11 HCA COPYRIGHT 2001 ACS
 132:71358 Electrophotographic apparatus using silicon-based photoconductors. Kaya, Takaaki; Sakami, Yuji; Suzuki, Hideaki; Kamibayashi, Makoto; Mikuriya, Hiroshi (Canon K. K., Japan). Jpn. Kokai Tokkyo Koho JP 2000010313 A2 20000114, 25 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1998-174776 19980622.
- AB The electrophotog. app. contains a cylindrical photoreceptor comprising an elec. conducting support, a Si-based amorphous photoconductor layers, and a H-contg. amorphous C surface layer. In the app., toner images are formed by using developers with av. particle size 0.004-0.012 mm and toners are recovered and reused. The surface layers may be fluorinated by **plasma etching**. The app. shows good **cleaning** property and gives low-fog images even if spent toners are used.
- IC ICM G03G005-08
 ICS G03G005-08; G03G021-10
- CC 74-3 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
- ST electrophotog photoreceptor hydrogenated carbon surface layer; **plasma** CVD hydrocarbon electrophotog photoreceptor coating; fluorination **plasma** surface layer electrophotog photoreceptor; recycling toner electrophotog photoreceptor **cleaning** property
- IT **Etching**
 (plasma, fluorination by; silicon-based electrophotog. photoreceptors having hydrogenated carbon surface layers)
- IT Fluorination
 Vapor deposition process
 (plasma; silicon-based electrophotog. photoreceptors having hydrogenated carbon surface layers)
- IT 7440-01-9, Neon, uses 7440-37-1, **Argon**, uses 7440-59-7, **Helium**, uses 7727-37-9, Nitrogen, uses

- (diluent for fluorination gases; silicon-based electrophotog. photoreceptors having hydrogenated carbon surface layers)
- IT 75-10-5, Difluoromethane 75-38-7, 1,1-Difluoroethene 75-46-7, Trifluoromethane 75-73-0, Tetrafluoromethane 76-16-4, Hexafluoroethane 116-14-3, Tetrafluoroethene, reactions 593-53-3, Fluoromethane 2551-62-4, Sulfur hexafluoride 7664-39-3, Hydrogen fluoride, reactions 7790-91-2, Chlorine trifluoride
- (**plasma etchants**; silicon-based electrophotog. photoreceptors having hydrogenated carbon surface layers)
- IT 1333-74-0, Hydrogen, uses 7782-41-4, Fluorine, uses (silicon-based electrophotog. photoreceptors having hydrogenated carbon surface layers)
- L35 ANSWER 6 OF 11 HCA COPYRIGHT 2001 ACS
130:260787 **Cleaning** of contamination from electron-emissive elements. Knall, N. Johan; Porter, John D.; Stanners, Colin D.; Spindt, Christopher J.; Bascom, Victoria A. (Candescent Technologies Corporation, USA). PCT Int. Appl. WO 9917323 A2 19990408, 38 pp. DESIGNATED STATES: W: JP, KR; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (English). CODEN: PIXXD2. APPLICATION: WO 1998-US18509 19980922. PRIORITY: US 1997-940873 19970930.
- AB Multiple procedures are presented for removing contaminant material from electron-emissive elements of an electron-emitting device. One procedure involves converting the contaminant material into gaseous products, typically by operating the electron-emissive elements, that move away from the electron-emissive elements. Another procedure entails converting the contaminant material into further material and removing the further material. An addnl. procedure involves forming surface coatings over the electron-emissive elements. The contaminant material is then removed directly from the surface coatings or by removing at least part of each surface coating.
- IC ICM H01J
CC 76-12 (Electric Phenomena)
Section cross-reference(s): 66
ST **cleaning** electron emitter
IT Cathodes
Cleaning
Coating process
Contamination (electronics)
Optical imaging devices
Plasma cleaning
(**cleaning** of contamination from electron-emissive elements)
- IT Dielectric films
Etching
Photolysis
Surface oxidation
(in **cleaning** of contamination from electron-emissive

elements)
 IT Aldehydes, uses
 Aliphatic alcohols
 Alkanes, uses
 Alkenes, uses
 Alkynes
 Hydrogen halides
 Ketones, uses
 (in **cleaning** of contamination from electron-emissive elements)
 IT Carbides
 Oxides (inorganic), processes
 Silicides
 (in **cleaning** of contamination from electron-emissive elements)
 IT 7439-98-7, Molybdenum, processes 7440-02-0, Nickel, processes
 7440-05-3, Palladium, processes 7440-06-4, Platinum, processes
 (**cleaning** of contamination from electron-emissive elements)
 IT 50-00-0, Methanal, uses 56-23-5, Carbon tetrachloride, uses
 64-18-6, Formic acid, uses 64-19-7, Acetic acid, uses 66-25-1,
 Hexanal 67-56-1, Methanol, uses 67-64-1, Acetone, uses
 67-66-3, Trichloromethane, uses 74-82-8, Methane, uses 74-85-1,
 Ethene, uses 74-86-2, Ethyne, uses 74-87-3, Chloromethane, uses
 75-09-2, Dichloromethane, uses 75-10-5, Difluoromethane 75-73-0,
 Carbon tetrafluoride 79-09-4, Propionic acid, uses 111-27-3,
 Hexanol, uses 111-65-9, Octane, uses 124-38-9, Carbon dioxide,
 uses 302-01-2, Hydrazine, uses 593-53-3, Fluoromethane
 630-08-0, Carbon monoxide, uses 1333-74-0, Hydrogen, uses
 7439-90-9, Krypton, uses 7440-01-9, Neon, uses 7440-37-1
 , Argon, uses 7440-59-7, Helium, uses
 7440-63-3, Xenon, uses 7446-09-5, Sulfur dioxide, uses
 7553-56-2, Iodine, uses 7637-07-2, Boron trifluoride, uses
 7647-01-0, Hydrogen chloride, uses 7664-39-3, Hydrogen fluoride,
 uses 7664-41-7, Ammonia, uses 7722-84-1, Hydrogen peroxide, uses
 7726-95-6, Bromine, uses 7727-37-9, Nitrogen, uses 7732-18-5,
 Water, uses 7782-41-4, Fluorine, uses 7782-44-7, Oxygen, uses
 7782-50-5, Chlorine, uses 7783-06-4, Hydrogen sulfide, uses
 7783-07-5, Hydrogen selenide 7783-09-7, Hydrogen telluride
 7783-54-2, Nitrogen trifluoride 7784-42-1, Arsine 7803-51-2,
 Phosphorus trihydride 7803-52-3, Stibine 10024-97-2, Nitrous
 oxide, uses 10028-15-6, Ozone, uses 10034-85-2, Hydrogen iodide
 10035-10-6, Hydrogen bromide, uses 10102-43-9, Nitric oxide, uses
 10102-44-0, Nitrogen dioxide, uses 17778-80-2, Atomic oxygen, uses
 19287-45-7, Diborane 25377-83-7, Octene 30637-87-7, Hexanone
 32073-03-3, Octyne
 (in **cleaning** of contamination from electron-emissive elements)

L35 ANSWER 7 OF 11 HCA COPYRIGHT 2001 ACS

130:190535 Soldering in fabricating an electronic circuit. Nishikawa,
 Toru; Satoh, Ryohei; Harada, Masahide; Hayashida, Tetsuya; Shirai,

Mitugu (Hitachi, Ltd., Japan). U.S. US 5878943 A 19990309, 32 pp., Cont.-in-part of U.S. 5,816,473. (English). CODEN: USXXAM. APPLICATION: US 1996-753018 19961119. PRIORITY: JP 1990-36033 19900219; US 1991-656465 19910219; US 1992-890255 19920529; US 1994-240320 19940510; US 1995-578054 19951222.

- AB In soldering together 2 members of an electronic circuit, after an oxide or contaminated layer has been removed from the surface of a solder or bonding pad, e.g., the members are aligned in an oxidizing atm. Then the solder is heated in a nonoxidizing atm. to melt the solder and bond the members. **Cleaning** of the solder or bonding pad is performed by sputter-**cleaning**, laser **cleaning**, mech. polishing, or cutting.
- IC ICM H01L021-60
ICS B23K001-00
- NCL 228205000
- CC 76-3 (Electric Phenomena)
- ST soldering electronic circuit manuf; **cleaning** solder bonding pad electronic circuit manuf
- IT Laser radiation
(**cleaning** by; of solder and bonding pads in fabricating electronic circuits)
- IT Solders
(**cleaning** of; in fabricating electronic circuits)
- IT Cutting
Polishing
Sputter **etching**
(in **cleaning** of solder and bonding pads in fabricating electronic circuits)
- IT **Cleaning**
Plasma cleaning
(of solder and bonding pads in fabricating electronic circuits)
- IT 1333-74-0, **Hydrogen, processes**
7440-37-1, **Argon, processes** 7440-59-7,
Helium, processes 7727-37-9, **Nitrogen, processes**
(in soldering in fabricating electronic circuits)
- L35 ANSWER 8 OF 11 HCA COPYRIGHT 2001 ACS
- 130:176337 Semiconductor device, its fabrication, and dry **etching** posttreatment. Yabuta, Tetsushi; Ban, Atsushi; Yamakawa, Shinya; Kawai, Katsuhiko; Okamoto, Masaya (Sharp Corp., Japan). Jpn. Kokai Tokkyo Koho JP 11040813 A2 19990212 Heisei, 17 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1997-190248 19970715.
- AB The device has the 1st semiconductor thin film corresponding to a channel region and n+-doped the 2nd semiconductor thin film placed between the 1st film and the layer including a source electrode and a drain electrode and characterized by that the leak current I_{ds} between the source and the drain is approximated to $I_{ds} \cdot \text{times} \cdot L/W = A \exp(-E_a/kT)$ [E_a = activation energy (eV); k = Boltzmann's const.; T = temp. (K); W/L = size of the semiconductor element; A .ltoreq. $5E - 6$ (A) at $T = 303-338$ (K)] when the gate voltage is in the subthreshold region and the drain current is lower than $1E - 10$ (A).

The device is manufd. by a process including dry **etching** for forming contact layer of the source and drain electrodes followed by surface treatment of the element by **plasma** of gas having low reactivity. The surface of the chamber walls for dry **etching** and the surface of the **etched** substrate are treated with the above **plasma** to remove residual **etching** gas and reaction products. The process is suitable for back-channel **etching** of thin film transistor, etc.

IC ICM H01L029-786

ICS H01L021-336; H01L021-3065; C23F004-00

CC 76-3 (Electric Phenomena)

ST semiconductor device fabrication dry **etching** posttreatment; **plasma** treatment residual **etching** gas removal; thin film transistor dry **etching** posttreatment

IT **Plasma**

(of low reactive gas; semiconductor device fabrication including dry **etching** followed by **plasma** surface treatment for **cleaning** of substrate and chamber by)

IT Dry **etching**
Plasma etching

Semiconductor device fabrication
Thin film transistors

(semiconductor device fabrication including dry **etching** followed by **plasma** surface treatment for **cleaning** of substrate and chamber)

IT 1333-74-0, **Hydrogen, processes**

7440-37-1, **Argon, processes** 7440-59-7,

Helium, processes 7664-41-7, **Ammonia, processes**

7727-37-9, **Nitrogen, processes** 7782-44-7, **Oxygen, processes**

(**plasma**; semiconductor device fabrication including dry **etching** followed by **plasma** surface treatment for **cleaning** of substrate and chamber by)

L35 ANSWER 9 OF 11 HCA COPYRIGHT 2001 ACS

126:151740 Method for **cleaning** vacuum treatment apparatus.

Ogawa, Hiroshi (Yamagata Nippon Denki Kk, Japan). Jpn. Kokai Tokkyo Koho JP 08319586 A2 19961203 Heisei, 4 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1995-124890 19950524.

AB After an Al-contg. film formed on a semiconductor substrated is dry **etched** with Cl in a chamber, a gas mixt. of an O-contg. gas, a F-contg. gas, and a Cl-contg. gas is introduced into the chamber and **plasma** is generated therein to remove the reaction products remaining in the chamber. The preferred gases used for **cleaning** are O3, H2O, H2O2, COx, SOx, NOx, HF3, C2F6, CF4, SF6, Cl2, BCl3, SiCl4, and CCl4. The gas mixt. may be dild. with He, Ne, or Ar.

IC ICM C23F004-00

ICS C23G005-00; H01L021-3065

CC 76-11 (Electric Phenomena)

ST vacuum treatment app chamber **cleaning**; semiconductor substrate aluminum **etching cleaning**

- IT Vacuum apparatus
(chambers; method for **cleaning** vacuum treatment app.)
- IT **Cleaning**
Etching
(method for **cleaning** vacuum treatment app. after **etching** of aluminum on semiconductor substrates)
- IT Semiconductor materials
(method for **cleaning** vacuum treatment app. after **etching** of aluminum on substrates of)
- IT Steam
(**plasma** generation in gas contg.; in method for **cleaning** vacuum treatment app.)
- IT 7429-90-5, Aluminum, processes
(method for **cleaning** vacuum treatment app. after **etching** of)
- IT 56-23-5, Tetrachloromethane, processes 75-73-0, Tetrafluoromethane
76-16-4, Hexafluoroethane 2551-62-4, Sulfur hexafluoride
7722-84-1, **Hydrogen** peroxide, **processes**
7782-50-5, Chlorine, processes 7783-54-2, Nitrogen trifluoride
10026-04-7, Silicon tetrachloride 10028-15-6, Ozone, processes
10294-34-5, Boron trichloride 11104-93-1, Nitrogen oxide,
processes 12624-32-7, Sulfur oxide 12795-06-1, Carbon oxide
(**plasma** generation in gas contg.; in method for **cleaning** vacuum treatment app.)
- IT 7440-01-9, Neon, processes 7440-37-1, **Argon**,
processes 7440-59-7, **Helium**, processes
(**plasma** generation in gas dild. with; in method for **cleaning** vacuum treatment app.)
- L35 ANSWER 10 OF 11 HCA COPYRIGHT 2001 ACS
- 112:66270 Short-period gratings for long-wavelength optical devices.
Andideh, E.; Adesida, I.; Brock, T.; Caneau, C.; Keramidas, V.
(Cent. Compd. Semicond. Microelectron., Univ. Illinois, Urbana, IL,
61801, USA). J. Vac. Sci. Technol., B, 7(6), 1841-5 (English) 1989.
CODEN: JVTBD9. ISSN: 0734-211X.
- AB The reactive ion **etching** in InGaAsP and InP were
characterized in CH₄-based **plasma**. The role of H₂
, **He**, and **Ar** as diluents were investigated.
Highly anisotropic short-period gratings with periods as small as
0.2 .mu.m and with smooth **etched** surfaces are presented.
Auger electron spectroscopy was used to delineate a proper
processing sequence to obtain **etched** surfaces as
clean as the surface of control samples. The CH₄/**He**
gas mixt. is suggested for the fabrication of gratings as a
compromise for achieving good **etched** profiles as well as
to minimize hydrogen passivation of donors in **etched**
samples.
- CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related
Properties)
Section cross-reference(s): 76
- ST gallium indium arsenide phosphide **etching** grating
- IT Sputtering

- (**etching**, ion-beam, reactive, of gallium indium arsenide phosphide and indium phosphide, short-period grating fabrication in relation to)
- IT **Etching**
(sputter, ion-beam, reactive, of gallium indium arsenide phosphide and indium phosphide, short-period grating fabrication in relation to)
- IT 74-82-8, Methane, uses and miscellaneous
(**plasma**, reactive ion **etching** of semiconductors with)
- IT 1333-74-0, Hydrogen, uses and miscellaneous
7440-37-1, **Argon**, uses and miscellaneous
7440-59-7, **Helium**, uses and miscellaneous
(reactive ion **etching** of semiconductors with methane **plasma** contg.)
- IT 12645-36-2, Gallium indium arsenide phosphide 22398-80-7, Indium phosphide, uses and miscellaneous
(reactive-ion **etching** and diffraction grating for emission in)
- L35 ANSWER 11 OF 11 HCA COPYRIGHT 2001 ACS
96:14309 **Plasma cleaning and etching**.
(Yamazaki, Kyoei, Japan). Jpn. Kokai Tokkyo Koho JP 56123377 A2
19810928 Showa, 7 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP
1980-26387 19800303.
- AB A **plasma cleaning and etching** process
consists of **cleaning** the surfaces of a substrate (e.g.,
from a semiconductor material) with an inert gas (or its mixt. with
H 0.5-50 flow rate %) activated with induction energy.
- IC C23F001-00
CC 76-11 (Electric Phenomena)
ST **plasma cleaning etching** semiconductor
material; hydrogen **cleaning etching**
semiconductor material
- IT **Helium**-group gases, uses and miscellaneous
(**cleaning and etching** by **plasma**
from hydrogen contg., of semiconductor materials)
- IT **Plasma**, chemical and physical effects
(**cleaning and etching** by, of semiconductor
surfaces)
- IT Semiconductor materials
(**cleaning and etching** of, by **plasma**
from **argon** contg. hydrogen)
- IT **Etching**
(of semiconductor surfaces by **plasma** from hydrogen
contg. **argon**)
- IT **Cleaning**
(of semiconductor surfaces, by **plasma** from hydrogen
contg. **argon**)
- IT 1333-74-0, uses and miscellaneous
(**cleaning and etching** by **plasma**
from **argon** contg., of semiconductor materials)

IT 7440-37-1, uses and miscellaneous
(**cleaning** and **etching** by **plasma**
from hydrogen contg., of semiconductor materials)

=> d l36 1-18 ti

- L36 ANSWER 1 OF 18 HCA COPYRIGHT 2001 ACS
TI Process for ashing organic materials from semiconductor substrates
- L36 ANSWER 2 OF 18 HCA COPYRIGHT 2001 ACS
TI Gas barrier packaging
- L36 ANSWER 3 OF 18 HCA COPYRIGHT 2001 ACS
TI Process for **plasma** ashing organic materials from substrates
- L36 ANSWER 4 OF 18 HCA COPYRIGHT 2001 ACS
TI Purification of crude tantalum by **plasma**-arc melting for ingots suitable for remelting
- L36 ANSWER 5 OF 18 HCA COPYRIGHT 2001 ACS
TI Effect of inert and molecular gases on the laser efficiency of a neon-hydrogen **plasma** laser on neon .lambda. = 585.3 nm
- L36 ANSWER 6 OF 18 HCA COPYRIGHT 2001 ACS
TI Amorphous hydrogenated carbon films: deposition and characterization
- L36 ANSWER 7 OF 18 HCA COPYRIGHT 2001 ACS
TI Interaction of a two-component hydrogen-containing glow discharge **plasma** with palladium and stainless steel
- L36 ANSWER 8 OF 18 HCA COPYRIGHT 2001 ACS
TI Silyl (SiH₃) radical density in pulsed silane **plasma**
- L36 ANSWER 9 OF 18 HCA COPYRIGHT 2001 ACS
TI **Plasma** spraying of zirconia coatings
- L36 ANSWER 10 OF 18 HCA COPYRIGHT 2001 ACS
TI Coating of fabrics
- L36 ANSWER 11 OF 18 HCA COPYRIGHT 2001 ACS
TI Laser heated gas jet - a soft x-ray source
- L36 ANSWER 12 OF 18 HCA COPYRIGHT 2001 ACS
TI Electrical and spectral characteristics of a narrow (submillimetric) electrodeless a.c. discharge in **triple** and quadruple **gas** mixtures
- L36 ANSWER 13 OF 18 HCA COPYRIGHT 2001 ACS
TI Large volume **plasma** production by 2.45GHz microwaves

L36 ANSWER 14 OF 18 HCA COPYRIGHT 2001 ACS
TI Decay of the **argon plasma** jet surrounded by
argon, helium, nitrogen and hydrogen
gases

L36 ANSWER 15 OF 18 HCA COPYRIGHT 2001 ACS
TI Calibrated neutral atom spectrometer for measuring **plasma**
ion temperatures in the 0.165- to 10-keV energy region

L36 ANSWER 16 OF 18 HCA COPYRIGHT 2001 ACS
TI Interaction of electron beams with **plasma** in a
"probkotron"

L36 ANSWER 17 OF 18 HCA COPYRIGHT 2001 ACS
TI Drift waves in a radio-frequency **plasma**

L36 ANSWER 18 OF 18 HCA COPYRIGHT 2001 ACS
TI Supplementary Rankine-Hugoniot calculations for thermal
plasmas

=> d 136 1,2,3,7,9,14 cbib abs hitind

L36 ANSWER 1 OF 18 HCA COPYRIGHT 2001 ACS
134:335369 Process for ashing organic materials from semiconductor
substrates. Levenson, Eric O.; Waleh, Ahmad (Anon, Inc., USA).
U.S. US 6231775 B1 20010515, 7 pp., Cont.-in-part of U.S. Ser. No.
14,695, abandoned. (English). CODEN: USXXAM. APPLICATION: US
1999-407014 19990928. PRIORITY: US 1998-14695 19980128.

AB Ashing of an org. film from a substrate is carried out by providing
a **plasma** comprising a gas or gas mixt. selected from the
following groups: (1) SO3 alone; (2) SO3 plus 1 supplemental
gas; and (3) SO3 plus at least two supplemental
gases. Any of the following gases may be employed as the
supplemental gas: O2, O3, **H2**, N2, N oxides, **He**,
Ar, or Ne. Also, a process is provided for forming a
plasma in a reaction chamber from reactant gases contg. SO3.
The process includes introducing the SO3 into the reaction chamber
from a storage vessel through a delivery manifold by independently
heating the storage vessel and the delivery manifold to a temp.
sufficient to maintain the SO3 in its gaseous state or liq. state
and by heating the reaction chamber to control the reaction rate of
the SO3 and also control condensation of the SO3 to maintain a
stable **plasma** state.

IC ICM H01L021-3065
NCL 216067000
CC 76-3 (Electric Phenomena)
Section cross-reference(s): 73, 75, 77
IT Ashing
Liquid crystal displays

Magnetic recording heads
 Photomasks (lithographic masks)
 Photoresists
Plasma

Printed circuit boards
 Semiconductor materials

(process for ashing org. materials from semiconductor substrates)

IT 1333-74-0, **Hydrogen**, processes
 7440-01-9, Neon, processes 7440-37-1, **Argon**,
 processes 7440-59-7, **Helium**, processes
 7446-11-9, Sulfur trioxide, processes 7727-37-9, Nitrogen,
 processes 7782-44-7, Oxygen, processes 10024-97-2, Nitrous
 oxide, processes 10028-15-6, Ozone, processes 10102-43-9, Nitric
 oxide, processes 10102-44-0, Nitrogen dioxide, processes
 12033-49-7, Nitrogen trioxide
 (process for ashing org. materials from semiconductor
 substrates)

L36 ANSWER 2 OF 18 HCA COPYRIGHT 2001 ACS

134:279943 Gas barrier packaging. Watanabe, Haruhiko (Japan). Jpn.
 Kokai Tokkyo Koho JP 2001114347 A2 20010424, 5 pp. (Japanese).
 CODEN: JKXXAF. APPLICATION: JP 1999-328615 19991014.

AB Packaging bag or paper carton is vacuumed, loaded with
 organometallic compd. and/or hydrocarbon gas or gas mixt., and
 irradiated with high-frequency irradiation or microwave to form gas
plasma and subsequently a evapd. membrane of metal oxide or
 diamond-like carbon (DLC) having good gas barrier ability inside the
 packaging bag or paper carton. The organometallic compd. and/or
 hydrocarbon gas or gas mixt. is loaded under vacuum to enable the
 swelling of the packaging bag or carbon and to ensure even formation
 of the gas barrier evapd. membrane. The method is useful for
 manufg. packaging materials with long shelf life.

IC ICM B65D081-20
 ICS B65D030-00; C23C016-27; C23C016-40

CC 17-4 (Food and Feed Chemistry)

IT Microwave
 Packaging process
Plasma

(gas barrier packaging)

IT 71-43-2, Benzene, biological studies 74-85-1, Ethylene, biological
 studies 74-86-2, Acetylene, biological studies 108-88-3,
 Toluene, biological studies 110-54-3, Hexane, biological studies
 110-82-7, Cyclohexane, biological studies 124-38-9, Carbon
 dioxide, biological studies 1330-20-7, Xylene, biological studies
 1333-74-0, **Hydrogen**, biological studies
 2973-29-7, 1,1,3,3-Tetraethyldisiloxane
 3277-26-7, 1,1,3,3-Tetramethyldisiloxane
 7429-90-5D, Aluminum, alkyl- 7439-95-4D, Magnesium, alkyl-
 7440-37-1, **Argon**, biological studies
 7440-59-7, **Helium**, biological studies 7440-63-3,
 Xenon, biological studies 7440-67-7D, Zirconium, alkyl-
 7727-37-9, Nitrogen, biological studies 7782-44-7, Oxygen,

biological studies
(**gas** barrier packaging)

L36 ANSWER 3 OF 18 HCA COPYRIGHT 2001 ACS

134:260110 Process for **plasma** ashing organic materials from substrates. Levenson, Eric O.; Waleh, Ahmad (Anon, Inc., USA). PCT Int. Appl. WO 2001024245 A1 20010405, 18 pp. DESIGNATED STATES: W: CA, CN, IL, JP, KR, SG; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (English). CODEN: PIXXD2. APPLICATION: WO 2000-US26400 20000925. PRIORITY: US 1999-407014 19990928.

AB Ashing of an org. film from a substrate is carried out by providing a **plasma** comprising a gas or gas mixt. selected from the following groups: (a) S trioxide alone; (2) S trioxide plus one supplemental **gas**; and (3) S trioxide plus at least two supplemental gases. Any of the following gases may be employed as the supplemental **gas**: O, ozone, H, N, N oxides, He, Ar, or Ne. Also, a process is provided for forming a **plasma** in a reaction chamber from reactant gases contg. S trioxide. The process includes introducing the S trioxide into the reaction chamber from a storage vessel through a delivery manifold by independently heating the storage vessel and the delivery manifold to a temp. sufficient to maintain the S trioxide in its gaseous state or liq. state and by heating the reaction chamber to control the reaction rate of the S trioxide and also control condensation of the S trioxide to maintain a stable **plasma** state.

IC ICM H01L021-311

ICS G03F007-42

CC 76-3 (Electric Phenomena)

ST **plasma** ashing org sulfur oxide

IT Optical imaging devices

(flat panel; process for **plasma** ashing org. materials from substrates using sulfur trioxide mixts.)

IT Ashing

(**plasma**; process for **plasma** ashing org. materials from substrates using sulfur trioxide mixts.)

IT Ceramics

Electric insulators

Liquid crystal displays

Magnetic recording heads

Paints

Photomasks (lithographic masks)

Photoresists

Printed circuit boards

(process for **plasma** ashing org. materials from substrates using sulfur trioxide mixts.)

IT Epoxy resins, processes

Organic compounds, processes

Organic glasses

Organometallic compounds

Polymers, processes

- (process for **plasma** ashing org. materials from substrates using sulfur trioxide mixts.)
- IT Alloys, uses
(process for **plasma** ashing org. materials from substrates using sulfur trioxide mixts.)
- IT Group IIB element chalcogenides
(process for **plasma** ashing org. materials from substrates using sulfur trioxide mixts.)
- IT Group IIIA element pnictides
(process for **plasma** ashing org. materials from substrates using sulfur trioxide mixts.)
- IT Metals, uses
(process for **plasma** ashing org. materials from substrates using sulfur trioxide mixts.)
- IT Nitrides
(process for **plasma** ashing org. materials from substrates using sulfur trioxide mixts.)
- IT Oxides (inorganic), uses
(process for **plasma** ashing org. materials from substrates using sulfur trioxide mixts.)
- IT Oxynitrides
(process for **plasma** ashing org. materials from substrates using sulfur trioxide mixts.)
- IT 1333-74-0, **Hydrogen**, uses 7440-01-9, Neon, uses 7440-21-3, Silicon, uses 7440-37-1, **Argon**, uses 7440-56-4, Germanium, uses 7440-59-7, **Helium**, uses 7446-11-9, Sulfur trioxide, uses 7727-37-9, Nitrogen, uses 7782-44-7, Oxygen, uses 10024-97-2, Nitrogen oxide (N₂O), uses 10028-15-6, Ozone, uses 10102-43-9, Nitrogen oxide (NO), uses 10102-44-0, Nitrogen oxide (NO₂), uses 11104-93-1, Nitrogen oxide, uses
(process for **plasma** ashing org. materials from substrates using sulfur trioxide mixts.)

L36 ANSWER 7 OF 18 HCA COPYRIGHT 2001 ACS

117:94428 Interaction of a two-component hydrogen-containing glow discharge **plasma** with palladium and stainless steel. Sharudo, A. V.; Mukhamadiev, R. E. (Arifov Inst. Electron., Tashkent, 700143, Uzbekistan). Vacuum, 43(5-7), 623-5 (English) 1992. CODEN: VACUAV. ISSN: 0042-207X.

AB The interaction of a 2-component H-contg. glow discharge **plasma** ($q = 3$.times. 10^{16} ion $\text{cm}^{-2} \text{ s}^{-1}$, $U = 250-450$ V) with Ar, He, N, and O impurities ($P_{\text{imp}}/P_{\text{H}} = 0-1.0$) with Pd and stainless steel was studied using TPD, DRS, and H permeability techniques. For Pd the rate limiting step for H penetration **processes** by glow discharge **plasma** causes an increase in the penetrating flow from 4.2 .times. 10^{14} to 5.6 .times. 10^{18} atom $\text{cm}^{-2} \text{ s}^{-1}$ ($T_{\text{mem}} = 400$ K) and from 1.2 .times. 10^{15} to 4.1 .times. 10^{16} atom $\text{cm}^{-2} \text{ s}^{-1}$ ($T_{\text{mem}} = 470$ K), resp. The addn. of impurities into the H **plasma** results in a decrease of the penetrating flow by a factor of 2-3 for inert **gases** and more than an order of

magnitude for impurities of chem. active gases. Changes in the H re-emission rate const., SR, depending on **plasma** compn. was shown for stainless steel surfaces. The re-emission rate const. ranged from 1.58 to 2.63 .times. 10^{-2} cm s⁻¹ for **He** impurities, from 1.58 to 3.05 .times. 10^{-2} cm s⁻¹ for **Ar** impurities and from 1.58 to 10.5 .times. 10^{-2} cm s⁻¹ for N impurities.

CC 55-6 (Ferrous Metals and Alloys)

ST palladium glow discharge **plasma** hydrogen; stainless steel glow discharge hydrogen

IT **Plasma**

(hydrogen-contg., glow-discharged, palladium and stainless steel interaction with)

IT 1333-74-0, Hydrogen, reactions

(glow-discharge **plasma** contg., palladium and stainless steel interaction with)

IT 7440-05-3, Palladium, reactions 12597-68-1, Stainless steel, uses (**plasma** interaction with, in hydrogen-contg. glow discharge)

L36 ANSWER 9 OF 18 HCA COPYRIGHT 2001 ACS

112:144292 **Plasma** spraying of zirconia coatings. Varacalle, D. J., Jr.; Smolik, G. R.; Wilson, G. C.; Irons, G.; Walter, J. A. (Idaho Natl. Eng. Lab., EG and G Idaho, Inc., Idaho Falls, ID, 83415-2210, USA). Mater. Res. Soc. Symp. Proc., 155 (Process. Sci. Adv. Ceram.), 235-46 (English) 1989. CODEN: MRSPDH. ISSN: 0272-9172.

AB As part of a study of the dynamics that occur in the plume of a thermal spray torch, the deposition of Y2O3-stabilized ZrO2 was examd. Expts. were conducted using a Taguchi fractional factorial design. Nominal spray parameters were: 900 A, 36 kW, 100 std. ft³/h **Ar** primary **gas** flow, 47 std. ft³/h **He** secondary **gas** flow, 11.5 std. ft³/h **Ar** powder carrier **gas** flow, 3.5 lb/h powder feed rate, 3 in. spray distance, and an automated traverse rate of 20 in/s. The coatings were characterized for thickness, hardness, and microstructural features with optical microscopy, SEM, and x-ray diffraction. Attempts were made to correlate the features of the coatings with the changes in operating parameters. Numerical models of the phys. processes in the torch column and plume were used to det. the temp. and flow fields. Computer simulations of particle injection (10-75 .mu.m ZrO2 particles) are presented.

CC 57-2 (Ceramics)

ST zirconia yttria coating **plasma** spraying

IT Coating process

(**plasma**, with zirconia, properties in relation to)

IT 1314-23-4, Zirconia, uses and miscellaneous

(coatings, yttria-stabilized, **plasma** spraying of, properties in relation to)

IT 1314-36-9, Yttria, uses and miscellaneous

(zirconia coatings stabilized by, **plasma** spraying of, properties in relation to)

L36 ANSWER 14 OF 18 HCA COPYRIGHT 2001 ACS

90:178811 Decay of the **argon plasma** jet surrounded

by **argon**, **helium**, nitrogen and **hydrogen**

gases. Honda, Takuya; Kanzawa, Atsushi (Dep. Chem. Eng., Tokyo Inst. Technol., Tokyo, Japan). Am. Soc. Mech. Eng., [Pap.], 78-HT-12, 8 pp. (English) 1978. CODEN: ASMSA4. ISSN: 0402-1215.

AB An **Ar plasma** jet, having initial centerline temp. of 10,000 K, was ejected into several types of coaxial gas flow, i.e., **Ar**, **He**, N, and H, at low pressure (507 Pa). Anal. and exptl. studies were performed on the centerline decay of the **plasma** jet. The centerline temp. and the degree of ionization varied characteristically with the type of surrounding gases. The differences between monoat. and diat. gases are large and are explained. For monoat. **gases**, the ordinary **three**-body recombination mainly alkyls. On the other hand, for diat. **gases**, a new type 3-body recombination terminates.

CC 76-4 (Electric Phenomena)

ST **argon plasma** jet decay; **helium** coaxial gas jet; nitrogen coaxial jet; **hydrogen** coaxial jet

IT **Plasma**

(jet, **argon**, decay of)

IT Jets

(**plasma**, of **argon**, decay of)

IT 1333-74-0, properties 7440-37-1, properties

7440-59-7, properties 7727-37-9, properties

(decay in surroundings of, of **argon plasma** jets)

IT 7440-37-1, properties

(**plasma**, jet, decay of)